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ADDRESSES AND ORIGINAL ARTICLES

INVENTIONS AND THE OUTLOOK IN NEUROLOGY*

By James Collier, M.D., F.R.C.P. Lond.

CONSULTING PHYSICIAN, ST. GEORGE'S HOSPITAL; PHYSICIAN, NATIONAL HOSPITAL, QUEEN SQUARE

For my title to-day I have chosen the word "invention" as best fitting the bringing in of a new idea—an invention of the mind which may prove to be a discovery of the truth, or may fail as a false hypothesis, as well as the bringing in of a demonstrable fact or of a new method. My address is a story of remarkable flights of fancy long ago which are now the proved facts of our belief and of other "castles in the air" which became for the time the strongholds of the scientific world, who dwelt therein for a long time, contented because the building was beautiful to think upon and could be altered at will by successive occupants according to their fancy and who would not see a notice long before put up, that no mortar or foundations of "busy common sense" are available in this country. These castles are now largely deserted and such as dwell therein are not in security.

Wonderful inventions for the study of the structure of the nervous system and tireless research have resulted in knowledge practically complete of the most intricate and marvellously beautiful network with input paths leading from the outside world and output paths leading to the muscles for action, almost incredible in its extent, everywhere continuous and so complicated that it is impossible to prove or to conceive how it works except in a few of its lower and grossly mechanical regions. This vast and solid edifice of proved knowledge of structure has added little to our knowledge of function and disease. This quarry has been worked out and labour in it has well-nigh ceased. Delving into the function of the nervous system by experiment has reached so high a refinement that the signals by which each part works can be made visible and audible. Always the same signals in every part alike only more and more rapidly repeated as the message becomes stronger and more urgent, and the end-result of these fine labours is some knowledge as to how the lower and simpler regions—namely, the spinal cord and brain-stem—work. To the greatest of living physiologists who has spent a long life in the experimental study of the nervous system—the Rede lecturer for last year, Sir Charles Sherrington—the highest and largest part of the nervous system, the brain, is still mainly a form and a series of events, and his ignorance of much of their relation bids him despair. Yet proclaiming himself an optimist, as opposed to a defeatist, he puts the question: "Will it ever be possible to understand the nervous system?"

In the recognition and distinction of the nervous diseases the past century has brought an ever-increasing and now almost complete knowledge which has not yet and will not reach finality, for disease is subject to evolution and devolution and disappearance at least for a time. The causation of many of the diseases is now clear, and of recent years studies of biochemistry and of virus infection have brought suggestions of what the future may discover in maladies of which we do not know the cause. Methods of treatment though far behind those of diagnosis are advancing, and at the moment we seem to be in possession of means of diagnosis and treatment which will surely remove the terrible diseases, general paralysis and locomotor ataxy, from the community. Yet the fact remains that the four most prevalent and relentless of the nervous diseases—disseminate sclerosis, progressive muscular atrophy, paralysis agitans, and most of the vascular diseases—come before us without any clue whatsoever as to their cause, and without any means whatsoever of their prevention, nor in the case of progressive muscular atrophy even of the slightest amelioration. There are the hopes of the immediate future.

The means by which invention begins, the arousing of that lasting interest which does not rest until discovery is made, is often intangible and a thing perchance and of personality, but sometimes it has been recorded, and I may introduce the great discoveries in neurology with an instance.

Gall: The Pyramidal Tract

At the end of the eighteenth century a self-conscious lad pondered upon his disability to answer promptly in class the things he knew well, and concluded that it was because nature had not given him a fine forehead and prominent eyes. His interest in the brain and speech never thereafter left him. He became a very great anatomist of the nervous system, and he proved by his dissection the definite structural path from brain to muscle partly crossing in the medulla—the pyramidal path—and his proof was then and there accepted by the knowledgeable world for all time. Like Harvey he was not the first inventor of this idea, but like Harvey he gave such proof of its truth that no one wished to deny it. Gall's discovery of a definite pathway conveying movement from brain to muscle was the foundation of all subsequent paths of function within the nervous system. In his early days Franz Josef Gall laid down the truest conception of the brain as the exclusive seat of the highest nervous functions only. By his conception of speech as a function of the forward part of the brain he was the inventor of the idea of localisation of function in the brain. It does not detract from the greatness of the discoveries of this remarkable man that he went over into phrenology and died discredited, torn from his high position by the prophetic denunciation of Flourens that there are no separate highest functions to be localised in the brain, but that all are interwoven. Around his conception of cerebral localisation such a war was raged during the nineteenth century—complete defeat at first, and then after years complete triumph, and then later defeat not yet complete—as has stimulated more investigation and produced more useful discovery than any other event in the history of neurology. At the moment the localisation of function in the brain is presumed by our physiologists, but admittedly without means of scientific proof. The only proved localisation of function is that of the conduction tracts—the input and output paths which connect the animal with the outside world.

Purkinje: The Nerve-cell

In 1835 an Austrian priest of gipsy family became possessed of a microscope and, like the inventor of bacteriology—Leeuenhoeck, the linen draper—he became interested therein. In a short space of time he had discovered the nerve-cell which, added to Gall's nerve-tract, was the instigation of all later

* The Harveian Oration delivered before the Royal College of Physicians of London on Oct. 18th, 1934.

discovery, and had invented a hardening reagent—bichromate of potash, which would allow sections of soft tissue to be cut, a machine—the microtome to cut the sections, a stain—carmine to bring out the details, a clarifying reagent—oil of cloves, which made microscopic examination possible, and Canada balsam with which permanent preparations could be made. Johannes Evangelista Purkinje's inventions were epoch-making in the progress they caused. He was removed from the priesthood and made professor of physiology at Breslau. As the fruits of these fine inventions came at once the establishment of the cellular theory of tissues from Schleiden and Schwann, and the cellular pathology of Virchow. Rosenthal demonstrated that the nerve-tract was made up of fibres springing from the nerve-cell, and Schwann found the insulating sheath which protects the nerve-fibres. Waller, by his methods of degeneration, commenced the tracing of the nerve-tracts within the nervous system. Thereafter, with the wonderful discoveries and patient work largely of the German school, in which the names of Weigert, Edinger, Cajal, and Golgi stand out, the structure of the nervous system has been made known with such delicacy of detail, such intricacy of connexions, such enormity in amount, as to be altogether outside the possibilities of present-day comprehension of the relation of structure to function, except in its lowest and least complicated regions. It is referred to nowadays as one entity—"the nervous network"—just as it was first named the "sensorium commune" a century and a half ago.

Prochaska: Reflex Action

In 1784 a professor of anatomy in Moravia wrote a very short account of the nervous system, and in attempting to explain how it worked his flight of thought rose to almost the exact present-day conception. He said that "physical and mental stimuli acting upon ascending nerves are conveyed directly through the ganglia and network of nerve-threads, to be reflected thence by means of descending nerves with a result in action." This wonderful discovery in thought of reflex action, arrived at so far as we know without definite experiment, is the foundation of most of what we now know as to the way in which the nervous system works. I will ask you to compare these words of Georg Prochaska with those of Sir Charles Sherrington in the Rede lecture for last year:—

> "Brain and nerve are but a skilfully laid train of powder between the muscles it fires and the restless world outside which fires it. The question who pulls the trigger is easily answered. It is the outside world, and again an animals motor behaviour where the brain nets are large excels in variety and nicety but it fails to offer anything radically different from reflex action elsewhere."

By actual experiment Sir Charles Bell at Middlesex Hospital, Majendie in Paris, and others discovered the function of the spinal roots as input and output paths by which reflex action is carried on, and Bell most importantly first conceived of the long reflex processes which went as high as the brain. Now all unconscious action is reflex action. The great Pavlov and others have shown us how large a part reflex action plays in conscious action and behaviour. It is when we arrive at those processes in the brain which are not traceable to outside stimuli, and cannot be reduced to the principle of reflex action, that our knowledge as to how the mechanism works fails rapidly and finally. I may perhaps give you a simple example of the utter dependance of high cerebral function upon a reflex process.

When I speak to you my speech does not flow out from well-trained speech centres in the brain as does water from a full cistern. I must have an immediate and delicate reflex return reaching my by my ears and by the sensation of movement of my lips which keep me instantly informed as I go along that what I am saying is in correct pattern. If anything blocks the path of both those reflex actions, I shall not be able to finish even a sentence, my speech though long-practised will break down at once into an inarticulate jargon in which both words and pattern disappear. If through a faulty attention to my reflex signals I miss out an important word, my meaning tends to become unintelligible to my listeners and my speech an imperfect function.

Hughlings Jackson: Nervous Function

Hughlings Jackson, who is the pride of English neurology as Harvey is of English medicine, was an inventor who greatly influenced and moulded the present position of neurology. In method he was the ablest deducer from what seemed to be the minimum of observation, but his chief genius was that he was a relentless dreamer who criticised with a positive inquisition the flights of thought to which he rose, and apparently only gave to the world those which survived this ordeal, for there is hardly a thing of his which has not borne the test of time. He conceived that nature had builded the nervous system upon the same pattern of function in its several parts. And that at the lower stations the local requirements of the individual segments of the body were looked after, but that at higher levels the requirements of everything below were subserved in increasingly compound proportion, and that at the highest levels the nervous system was concerned with the requirements of the animal as a whole—perhaps some of these concern some parts of the brain more than others. This remarkable conception which arose when popular belief was convinced that centres for separate functions in the several parts of the brain were ascertained facts, is substantially the proved knowledge of the present day. The supporters of local centres of function in the brain had forgotten their parent, Gall, and the simple but emphatic statement by which he was overthrown: "There are no such separate functions for localisation." I may perhaps put it like this: the functions of seeing, hearing, and feeling are clearly separate so far as the nerve terminations in the eye, ear, and skin are concerned; but when a stimulus from one of these organs reaches the nervous network it becomes modified by all the other stimuli which are incoming at the moment, and the higher in the nervous system it spreads this modification increases, so that it becomes more and more difficult to think of to speak of it as a stimulus in one isolated function such as vision, hearing, or feeling. Hughlings Jackson wrote, I cannot conceive any function of vision apart from the function of movement.

I will give you a common example of the difficulty in which the principle of local function in the brain other than that in the tract of output and input has always placed the clinician. A patient of mine had a large tumour in the right occipital lobe which was removed with complete success, but the lobe which was supposed to be the seat of one-half of his visual life was destroyed. For the next 20 years, though he could not see to his left side, he carried on his occupation as a highly skilled metal worker, nor was his judgment in filing true to one-hundredth of an inch in the least impaired, nor his visual memory or appreciation in any way lessened.

It seems clear that the local loss of function which one sees daily from local lesions of the brain is always the result of the blocking of the input and output

paths, and I have arrived at the conclusion that when mental defect occurs from a not too extensive local lesion of the brain it results from a block upon those important tracts which put the several regions of the brain in touch with one another, and never from lesions of the higher regions of the brain which were formerly supposed to subserve mental functions exclusively. Therefore we have now the vast expansion of the brain in the words of Sherrington :—

"as an input and output signalling system which is newly arisen as a gigantic combining mechanism for the signals from the outside world and as a dominant part of the nervous system which tends to deal with the requirement of the animal as a whole more than does any other part."

Todd: Locomotor Ataxy and Peripheral Neuritis

One of the most remarkable inventions in a flight of thought, to become a proved principle a century later, came from the distinguished founder of King's College Hospital, Robert Bentley Todd, in an attempt to explain lead paralysis to his pupils. He said :—

"I believe that the muscles and nerves are early affected and that at a later period the nerve centres may become implicated. The nervous system is thus first affected at its periphery in the muscles and nerves and the poisonous influence continuing the contamination gradually advances towards the centre."

Recently it has been shown by Aub and others that in lead paralysis accumulation of the lead occurs first in the affected muscles, and that the poison seeps up through the nerve-endings into the nerves and reaches the central nervous system. The principle that the nerves are protected by their fatty sheaths against the advent of poisons and infections everywhere but where the nerve-endings are exposed in the extreme periphery, and that it is only in these exposed terminals that noxious agents can gain access and that they travel by a process of seepage along the nerve filament to gain the central nervous system is now generally accepted. Viruses that affect the nervous tissues travel in the same way and seemingly spread universally. As the only nerve terminals exposed to the outside world are the olfactory terminals in the nose, it follows that virus infections of the nervous system must be acquired by droplet infection of the nose or by wounds which expose the nerve filaments to infection.

Dr. Todd, who was by far the greatest clinical neurologist Britain had produced until the time of Hughlings Jackson, was the first to begin the breaking up of the spinal diseases, at that time all classed as "paraplegia," by his remarkable invention of locomotor ataxy as a distinct clinical entity. He did this with his usual vivid imagination and his customary absolute faith in his own powers of clinical and post-mortem observation. He states that the antero-lateral region of the cord is the path for common sensibility, and that the cerebellum is the organ commanding position and posture, and that the posterior columns are subservient to the cerebellum in conducting to it peripheral impressions of position for its guidance, and he makes the separation for the first time between spinal paraplegia and spinal ataxy. Todd wrote this four years before Romberg wrote his work, eight years before Russell Reynolds described the disease as "muscular anæsthesia," and eleven years before Duchenne christened it "progressive locomotor ataxy."

Quincke: Lumbar Puncture

In the year 1891 and in a quiet way came an invention which slowly led the most astounding progress in our knowledge of nervous disease and of its diagnosis, differentiation, and treatment. No event in the history of neurology has brought so many assets as has the invention of lumbar puncture. Heinrich Irenæus Quincke, of Magdeburg, conceived that he might relieve the symptoms of hydrocephalus by draining the cerebro-spinal fluid. Six years previously Corning, in America, had drained the fluid for the treatment of tuberculous meningitis, but Quincke was the first to make his invention known throughout the world. The discovery of changes indicative or characteristic of certain diseases in this hitherto unimportant fluid soon followed, and lumbar puncture has become a routine in diagnosis and treatment. It has given us the means of speedy relief from the agonising pain and danger of increased intracranial pressure, the cure of epidemic meningitis, of cerebral uræmia, of bromide and barbitone poisoning, and it has given us spinal anæsthesia. It has led to the discovery of the clinical features of meningeal hæmorrhage and its common cause in leaking aneurysms, to the easy recognition of the many forms of meningitis, and gives definite indications of prognosis in the sugar, chloride, and cell content. Pressure upon the spinal cord and occlusion of the cerebro-spinal space are now easily discovered by the increased protein in the stagnant fluid, and the exact site of the pressure can be made visible by the injection of lipiodol which is opaque to X rays.

Our whole conception of peripheral neuritis has been changed from one of an affection of the peripheral nerves into one of a malady creeping upwards along those nerves into the roots and central nervous system by the constant discovery of changes in the protein content of the cerebro-spinal fluid and often by the presence of large numbers of cells therein. In spirochætal infection lumbar puncture has discovered that when the nervous system is affected this occurs at quite an early stage and this infection often dies out. Those subjects in whom signs of infection persist in the cerebro-spinal fluid are alone liable to the advent in after-years of general paralysis and locomotor ataxy, and in the early treatment of such patients with malarial infection, mercury, and arsenic we think that we have now a certain means of stamping out altogether these terrible diseases from the community. Quincke's simple invention has caused an almost immeasurable bound forward in our ability.

Economo: The "Encaged" Virus

In 1921 Konstantin v. Economo conceived of a virus which, gaining access to the nervous system by the exposed olfactory terminals in the nose, becomes an "encaged virus" within the nervous system with no means of getting out and which if not conquered by the natural processes might remain indefinitely to cause either recurrences of symptoms from time to time or alternatively to progressive degeneration and death of the nerve elements. On this hypothesis he would explain the varying results of lethargic encephalitis, now a permanent cure, now a series of recurrences, and often again an advancing and resistless break-up of nervous function long after the initial infection and when the primary symptoms had been slight. He would explain the absence of case-to-case infection in lethargic encephalitis and in poliomyelitis that the virus is encaged by the time the symptoms appear and cannot get out to infect others.

Infection can only occur from carriers and in the presymptomatic period of these diseases when the virus is a surface saprophyte in the nose. Nicolau

and Galloway, at the Pasteur Institute, have shown how the viruses infecting the nervous system travel along the nerve threads to even the remotest parts of the nervous system, and that any peripheral nerve twig if dissected out and placed in the nervous system of another animal will cause infection. In the course of the universal spreading of the virus, the remarkable brightly staining "inclusion bodies" in the nerve-cells and the lymphocyte exudations along the nerve-fibrils remain as evidence of its passage. This complete invasion of the nervous system may occur without producing any symptoms at the time.

In the case of one encaged virus—that of herpes zoster—it seems clear that a local lowering of vitality of part of the nervous system by reason of injury, exposure to cold, arsenic administration, and other causes, may break the encagement and the virus discharges outwards along the debilitated nerve to flower upon the skin in the characteristic shingles and that flowering upon the skin is the only means of continuing the species and infecting other members of the community. After that flowering the virus within the nervous system dies as does the annual plant in the garden after its flowering. But it may happen that the debilitated nerve along which the virus is able to discharge is a motor nerve in which case the virus is unable to flower, but it may cause much commotion with lymphocytic swelling in the nerve, and this is undoubtedly the cause of many of the motor-nerve paralyses for which we have hitherto had no causal pathology, the commonest being Bell's facial paralysis from exposure to cold. Economo's principle of an infection encaged within the nervous system, existing and producing changes, without causing symptoms or alteration of function perhaps for years and finally destroying, is likely to bring important developments in the future. As a clinical fact it has been known for long years in the end-results of spirochætal infection, unrecognised at its advent and symptomless perhaps for half a lifetime.

I will speculate for a moment upon disseminate sclerosis. That this malady never appears before the age of puberty, means I submit that it takes 14 years or more for the pathological process to run before symptoms occur. A single transient characteristic sign of this disease lasting but a few days often occurs as long as 25 years before the progressive relentless disability begins, and I suggest that the process of demyelination is all over and irretrievable so soon as the progressive symptoms are present. We are faced with the inevitable scarring which long progressive and symptomless demyelination must entail. We must find some means of detecting the subjects of this disease during the symptomless stage if we are to treat them successfully. It is a remarkable fact that while disseminate sclerosis affects the central nervous system indifferently and everywhere, its destructive potentiality falls upon the younger elements of the nervous system only—those that have been recently acquired—namely, the pyramidal path, the coördinating mechanism for the upright stance and the finer movements of the hands and for the recently acquired function of speech. The older functions of the special senses with touch, pain, and temperature are never progressively destroyed.

Recent Inventions

Recently, accident has revealed a principle which may have an important bearing upon neurological discovery in the near future. A virus expert was working at the Lister Institute upon the disease of sheep which is called "louping ill" or "staggers." This is a virus disease which, entering by the usual nasal route, passes along the nerve threads to the cerebellum and there kills every nerve-cell while leaving the rest of the nervous system entirely unharmed. One day this pathologist became severely ill with acute meningitis which was supposed at first to be tuberculous, from which however he made a complete and rapid recovery. He went to America to carry on his researches upon louping ill. In the course of a short time two of his co-workers and two of his laboratory assistants were seized with severe acute lymphocytic meningitis which rapidly recovered, and it was proved from the serological reactions and by infection of animals that the recoverable meningitis in man was due to the same virus which causes destruction of the cerebellum in sheep.

I have myself recently seen three cases of acute meningitis in farmers who had been in contact with "louping ill" infected flocks, all of whom recovered and in the light of accidental infection among the virus workers producing recoverable meningitis, the nature of the infection seems clear.

The principle is that an infection in an animal which gives rise to a definite and incurable disease in an animal, may produce in man an entirely different and curable disease. We already had this principle demonstrated in the opposite sense in the virus of herpes febrilis which in man produces an insignificant event, but when introduced into the rabbit is apt to produce a fatal inflammation of the nervous system. Nervous diseases are common in animals and it is to the closer association of veterinary and human neurology and the wide investigation of the two taken together which have recently made a beginning that we look with hope to the discovery of cause and treatment in our common nervous diseases which are at present entirely mysterious.

The origin of disease and of tissue degeneration as the result of toxins from bacterial infection has entirely dropped out of neurology except in the cases of the three exotoxins of tetanus, diphtheria, and botulism, which differ entirely from the elusive factor in what is commonly referred to as toxic absorption, in that they are real and can be isolated and put in a bottle and their effect proved by experiment. A few years ago the origin of pernicious anæmia and of subacute combined degeneration of the spinal cord in toxic absorption from intestinal infection seemed to have good foundation on clinical and experimental grounds, but subsequent discoveries in gastric and hepatic function have swept all such ideas away and have introduced a deprivation origin for these diseases with highly successful means for their prevention and amelioration. Toxic absorption, at present much spoken of, will probably be similarly discarded from other realms of medicine within reasonable time.

It is highly interesting that the exotoxin of tetanus, by entering into combination with the protoplasm of the nervous system, produces a train of events identical with that of the virus of hydrophobia by living within the nerve protoplasm—in one case the highest degree of over-function in the fatal spasm, in another case a complete loss of function in the toneless paralysis, just like that of severe peripheral neuritis. It seems probable that the peripheral neuritis at present without known cause, which seems to be increasingly common among us, may be due to virus infection, and the relapsing tendency after partial recovery is like the behaviour of an encaged virus. The difficulty in this investigation is the discovery of a susceptible animal without which we cannot find or prove a virus as the cause of disease.

Deprivation conditions are likely to prove a fruitful field in the development of our knowledge of the causes of nervous disease. We already have tetany, subacute combined degeneration, beri-beri, and pellagra as due to known deprivations. The pigeon fed on polished rice and therefore paralysed almost

to death, which can be restored to complete strength and action in an hour by the administration of a few drops of infusion of rice husk, is a miracle of the effect which vitamin shortage and vitamin administration can make within the nervous system. It has recently been suggested that the commonest of nervous diseases—disseminate sclerosis—may prove to be a deficiency disease.

The recent invention of Sir Henry Dale that efferent stimuli in the vegetative nervous system produce their effect by the liberation of a chemical intermediary of the choline group, and that stimulation of the sympathetic in otherwise denervated skeletal muscle results in tonic contraction seems to me to open up the possibilities of great advance in our very scant knowledge of the pathology of the myotonias, myasthenias, and myopathies.

The Progress of Neurology

In the progress of neurology the all-essential labours of the physiologist and of the anatomist have almost reached finality. Much addition to the wealth of their discoveries is not to be expected in the future. The bacteriologist similarly seems to have added all that is possible from his researches. Not even the absorption of hypothetical toxins troubles us as a factor in the causation of nervous disease. The clinician and his inseparable pathologist have at the present time a fertile field in which regional diagnosis has become well-nigh perfect in which to carry on the separation begun by Thomas Parkinson a century ago and to show the easy recognition of new and distinct nervous diseases at present unrecognised. Thus the 30 years of the present century have given us subacute combined degeneration, dystrophia myotonica, amyotonia congenita, epiloia, Schilder's disease, narcolepsy, the meningeal hæmorrhages, the cerebral aneurysms, the pituitary syndromes, and many other distinct and easily recognisable maladies. It is astonishing how much more common a malady becomes when it has once been well described. There is scope for a rich harvest in the future, especially in the realms of peripheral neuritis, of the muscular atrophies, and of the vascular diseases.

The virus worker and the biochemist have probably the greatest immediate future before them, heralded by their collection of the plums of the immediate past in their researches on poliomyelitis, tetany, pernicious anæmia, and insulin.

The closer association between botanical, veterinary, and human medicine which has made a beginning will I think have an outcome in much advance, for nervous diseases are common in animals and have not received sufficient attention.

The psychiatrist struggles with his most difficult burden of advance almost alone. Neither anatomist, physiologist, bacteriologist, virus worker, or biochemist have as yet done anything material to clear the path for his progress as they have for the neurologist. Just as the highest functions of the nervous system allow of no physiological or anatomical analysis, so do its disorders at present admit no pathological and causal conception. The primeval forest of psychiatry with no pathways cleared to look around is hard beset with an ever-growing jungle of intricate terminology.

The progress of neurology in my lifetime has been amazing and its present position is highly advanced for a civilisation which Prof. Elliot Smith insists is not yet sixty centuries removed from primitive man. And yet I doubt not that neurology has but made a highly successful beginning.

THE SUSCEPTIBILITY OF MICE TO THE VIRUSES OF HUMAN AND SWINE INFLUENZA

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We reported in 1933 (Smith, Andrewes, and Laidlaw) that we had succeeded in infecting ferrets with a virus isolated from human cases of influenza and also with a strain of swine influenza virus sent us from America by Dr. Shope; at that time we were unsuccessful in infecting mice and other animals. Shope (1934) confirmed our observations and further showed that swine influenza virus, when inoculated intranasally into ferrets under ether anæsthesia, led to the appearance in the lungs of areas of atelectasis and consolidation, often extensive. We were able without difficulty to repeat Shope's work with swine influenza virus and also found that similar lung lesions could be induced in ferrets by injecting the virus directly into their lungs through the chest wall. In view of these developments we reinvestigated the susceptibility of mice to the viruses under study.

The Investigation

INFECTION OF MICE WITH SWINE INFLUENZA VIRUS

A 5 per cent. suspension of lung from a ferret infected with swine influenza was centrifuged and the supernatant fluid injected into the lungs of six mice through the chest wall; the virus used had been passaged 42 times through ferrets. The mice used were of the strain bred at the Medical Research Council's farm. All the mice apparently remained well, but when they were killed five days later one of the six was found to have plum-coloured consolidation of the posterior lobe of the right lung. A suspension prepared from this was inoculated intranasally into a ferret and into the lungs of six more mice. The ferret developed typical fever and symptoms of "ferret influenza"; and again one of six mice, killed four days later, showed consolidation of about half one lobe of lung. A suspension of this lung duly produced infection in a ferret. It was also inoculated into the lungs of six mice; six others received the virus intranasally. The latter were lightly etherised and virus placed upon their nostrils from a 1 c.cm. syringe, a drop at a time, until they had drawn in 0·1 c.cm. Later we found this quantity excessive and instilled only 0·05 c.cm. Four days later all the mice were killed. Three out of the six injected into the chest had lung lesions and so had five out of the six in which virus had been instilled into the nose.

Since this experiment we have used solely the intranasal method of inoculating mice, and have had no difficulty in carrying the virus in series; 16 transfers through mice have been accomplished. Mice have been killed usually on the fourth, fifth, or sixth day after infection. The affected portions of their lungs have been ground with powdered quartz and saline to make a 10 per cent. suspension which has been centrifuged. The supernatant fluid has been used as the source of infectious material for the next passage. Ferrets have been successfully infected with the virus which has been passed seven and eight times through mice. Such ferrets have been subse-

quently immune to the ferret strain of virus. Virus after 14 mouse passages also proved infective for a ferret, but this animal was not subsequently tested for immunity.

INFECTION OF MICE WITH HUMAN INFLUENZA VIRUS

The human influenza virus chiefly studied was the W.S. strain isolated from a case of influenza during an epidemic in the spring of 1933; in referring to it as influenza virus we are fully conscious that its claims to be regarded as the ætiological agent await further proof. The virus used for the first successful experiment had been passed 98 times through ferrets. The original attempt to infect mice with this virus was unsuccessful; six mice inoculated intranasally showed no lung lesions when killed four days later. A second attempt was more fortunate; of five mice similarly inoculated all became ill and three out of five showed, when killed, lung lesions like those of the mice infected with swine influenza. Passage from one of these mice was successful, every one of five mice becoming infected, and the strain has now been carried on in series through more than 11 passages. After 11 passages through mice the virus was still pathogenic for a ferret. The effects of the two strains of virus upon mice will be described together as they do not appear to differ appreciably from each other in this respect.

SYMPTOMS AND COURSE OF INFLUENZA IN MICE

Mice inoculated intranasally with a 10 per cent. suspension of virus have shown symptoms often after two days, but more frequently three or four days after infection. Their coats appear staring, they become less active, lose their appetite, and remain huddled together in a corner of their cage; their eyes are often half closed. They may become progressively worse or show apparent improvement for a time. Later the illness is characterised by exaggerated respiratory movements, definitely slower than those of normal mice. Mice may die as early as the third or fourth day of their illness, but symptoms may continue for at least 14 days before death. We cannot give figures of the percentage mortality, as most mice have been killed when obviously ill, but probably after a heavy dose of virus the large majority would die. One mouse has certainly recovered from an infection with swine influenza virus after being very ill for some days; it was subsequently found to be immune. With smaller doses of virus recovery is apparently more frequent. There is not necessarily a close correlation between symptoms and post-mortem findings. Thus, two mice killed four and eight days respectively after infection with the W.S. strain had very definite symptoms but no macroscopic lung lesions post mortem, while a number of others with very few symptoms showed extensive lung involvement at autopsy. The proportion of mice of our stock susceptible to strong virus is at least 90 per cent. and probably nearer 100 per cent.

In one experiment six mice were infected intranasally with the mouse strain of W.S. virus without the customary anæsthetic; several showed definite symptoms. When killed on the fifth day one mouse showed extensive, another localised lung lesions; the lungs of the other four were macroscopically normal. Eight mice inoculated at the same time under ether anæsthesia were all severely affected.

MORBID ANATOMY

The only constant changes observed post mortem have been in the lungs. In mice dying as the result of infection the lungs are deep red and almost airless except for small emphysematous areas at the periphery; in these animals all lobes are usually affected. In mice killed three to six days after infection all degrees of lung involvement are seen. Lesions consist of areas of plum-coloured consolidation, often with ill-defined margins; the more uniformly affected pieces sink in water. On section a good deal of fluid exudes from the cut surface. Most frequently attacked are the upper parts of the lungs on the dorsal aspect; areas of hepatisation can be seen apparently spreading out from the roots of the lungs on each side. In other mice the tip of one or other lobe is attacked and very often the azygos; in yet others only small, dusky red spots one or two millimetres across are seen. A strictly lobar distribution of lesions is unusual. In a few mice very definite greyish spots were visible on the lungs; all these gave a heavy growth of bacteria in culture and bacteria could be seen in smears from the affected areas.

HISTOLOGY AND BACTERIOLOGY

Histological studies of mouse lungs are at present very incomplete. In affected areas the larger bronchial tubes contain desquamated epithelial cells and leucocytes with pyknotic nuclei. There is some œdema and infiltration of leucocytes around the bronchioles and blood-vessels. The alveoli contain fluid and sometimes fibrin and red and white blood-cells. In stained smears may be seen many polymorphonuclear leucocytes with pyknotic nuclei and mononuclear cells with vacuolated cytoplasm.

Cultures were made from many affected lungs by dropping pieces into broth and by cultivation on plain agar, serum agar and blood agar. On ten occasions there was no growth on any medium. Four times cocci grew out in the cultures and rather more frequently growths of a small bipolar Gram-negative bacillus were obtained. On the solid media the colonies appearing were usually very scanty and we regarded them as of no ætiological significance.

FILTRATION OF VIRUS

(*a*) *Swine influenza virus.*—The lungs of three mice showing lesions after infection with swine influenza virus were pooled, minced, ground with quartz, and 20 c.cm. of a mixture of equal parts of Hartley's broth and saline. The supernatant fluid, after centrifuging, was filtered through a sand and asbestos pulp filter and then through a Gradocol collodion membrane (Elford, 1931) having an average pore size of 0·6 μ. Six mice were inoculated intranasally under ether with 0·05 c.cm. of this filtrate. Five days later all looked normal; two were killed and of these one showed moderately severe lung lesions, while the other was normal. By the eighth day after inoculation the remaining four looked definitely ill. One died on the ninth day and the others were killed when very ill on the tenth day; all these showed extensive lung lesions. The filtrate used for this experiment was inoculated also into a ferret, which developed a mild disease and was subsequently proved immune to ferret virus. Another ferret was successfully infected with lung virus from one of the mice which received the filtrate.

(*b*) *Human (W.S.) virus.*—A similar experiment was performed on six mice with W.S. virus. The filtration was carried out by the same technique. Three mice were killed five days after infection; two of the three showed lung lesions. The remainder looked ill on the fourteenth day and were sacrificed; all showed definite but localised lung lesions. In this instance also the original filtrate proved infectious for a ferret. Passage from the lungs of one of the mice killed on the fifth day infected five out of six mice.

It is clear, therefore, that both strains of virus are capable of passing a 0·6 μ membrane.

NEUTRALISATION BY ANTISERUM

Both viruses were neutralised by specific antisera.

(*a*) *Swine influenza virus.*—A centrifuged 10 per cent. emulsion of infected mouse lung was mixed with an equal volume of the pooled sera of three ferrets hyperimmunised against swine influenza. The mixture, after standing ten minutes at room temperature, was inoculated intranasally into six mice. One mouse died from unknown causes on the following day; the others remained quite well for 23 days, after which four were proved to be susceptible to infection. Of six control mice receiving a mixture of virus and an equal volume of saline, five died with typical lung lesions between the third and fifth days.

(*b*) *W.S. virus.*—A similar experiment was carried out with W.S. virus. The serum used was from a horse * hyperimmunised with tissue from ferrets infected with the W.S. strain; details concerning this serum will be published later. Five mice receiving mixtures of virus and undiluted serum survived, whilst five controls all died with typical lesions six or seven days after infection. The five mice surviving all proved susceptible on subsequent test 13 days later.

In a later experiment the same serum in a final dilution of 1 : 30 completely neutralised the W.S. virus; in a 1 : 100 final dilution it showed definite but incomplete neutralising power. Serum from the same horse before immunisation was without effect.

Autopsies have shown that an adequate amount of specific antiserum usually prevents the development of any lung lesions, but in a few mice, and in those receiving an inadequate amount of serum, one or more small patches of consolidation may occur. This absence of lung lesions in the mice receiving serum-virus mixtures seems to be a complete answer to the possible contention that these lesions are brought about merely by the inhalation of fluid and bacteria into the lungs during anæsthesia.

ATTEMPTED INFECTION BY OTHER ROUTES

We failed to infect mice with either the swine or human strains by subcutaneous, intraperitoneal, or intracerebral inoculation; mice so inoculated were tested later and found not to be immune, though their disease may perhaps have been less severe than that of the controls. The possibility that the disease may be modified in mice which have received previous injections by these routes has to be explored further.

CONTACT EXPERIMENT

We have no evidence suggesting that infection can pass by contact in a fatal form from mouse to mouse. In one experiment a group of mice exposed to others infected with swine influenza virus apparently acquired an immunity without having shown symptoms of the disease. This result has, however, not proved regularly reproducible with either strain.

EXPERIMENTS WITH B.W. STRAIN

The mice used in the experiments so far recorded were not isolated by the methods of rigid quarantine used in our experiments with ferrets. In fact, at the beginning of the work, mice infected with swine and human strains of virus were together in one room though in different boxes. We felt, therefore, that there was a possibility that swine influenza alone was pathogenic for mice and that the mice subsequently used for work with the human strain had been unwittingly infected with the swine virus. In order to exclude this possibility, we took some virus from another (B.W.) human strain which had been kept dried in the cold room for four months. This, after one passage through a ferret, was taken to the laboratories at Hampstead, where no swine influenza had been under study, and there used to infect six mice. Six days later these were killed and three of them proved to have small lung lesions of the usual character. These were pooled and a suspension used to infect six more mice. Four days later all these showed symptoms and were killed; five of them showed typical lesions, which in one mouse were very extensive. We were also able to show that bacteriologically sterile filtrates of these affected lungs would infect mice and that the virus was neutralised by the hyperimmune horse serum previously referred to. We accordingly feel satisfied that our virus strains of human origin are pathogenic for mice.

A word concerning the B.W. strain is necessary; it was the only fresh strain obtained by us in the winter of 1933–34. No widespread epidemic of influenza occurred in London during that winter and from a few sporadic cases diagnosed as influenza we failed to recover virus. The B.W. strain was obtained in early March from a patient afflicted with what was clinically typical influenza; this differed from the sporadic cases only in that it was locally highly infectious and attacked all the five members of one household. The B.W. strain was apparently identical, both immunologically and in its effect on ferrets with the W.S. strain isolated in the spring of 1933.

ADAPTATION OF VIRUS

In the earliest experiments described above with the swine influenza virus, only one out of six mice was successfully infected in each of the first two passages; later, success was the rule. This difference might have been due either to an adaptation of the virus or to the change in technique from intrapulmonary injection to intranasal inoculation under ether. The latter explanation seems the more likely. In a later experiment we infected six mice intranasally with swine influenza virus direct from a ferret; this virus had not been passed through mice. One died four and another five days after infection; the rest were killed on the seventh day, and all showed extensive lesions. Though evidence of gradual adaptation of swine influenza virus is thus lacking, it may be a factor in experiments with the human influenza; neither with the W.S. nor B.W. strains were the viruses as virulent for mice at the beginning of the mouse passages as they proved later. We have met, however, with such fluctuations in virulence of the virus that we are reluctant to draw hasty conclusions.

Discussion and Summary

In general, mice react to the viruses under study much as ferrets do, but pathological changes are found in the lungs rather than the nasal passages. As in ferrets, the only successful method of infection yet found consists in introducing the virus directly into the respiratory tract. Injection by other routes has in neither animal produced either infection or a striking immunity. In this respect our results differ from those of Gibson, Bowman, and Connor (1919), who claimed to have infected baboons, rhesus monkeys, rabbits, guinea-pigs, and mice with influenza virus by subcutaneous and intraperitoneal inoculation. The swine influenza infection in mice is like that in the ferret and unlike that in the pig: the virus alone

* The inoculations of the horse were kindly performed by our colleague, Major G. W. Dunkin.

produces a severe and perhaps fatal disease, no concomitant bacteria being necessary.

The work described is in a very early stage: obviously much remains to be done. It has been thought wise to publish this account now in order that other workers may have the opportunity of using mice for the study of influenza during the coming winter. Clearly, the mouse is an animal much more readily available for such work than is the ferret. We have some evidence that ferrets are more susceptible than are mice to infection with human influenza virus which has been passed repeatedly through ferrets; whether this applies to virus of immediate human origin we do not know. Our impression is that attention to certain points will make the successful infection of mice more likely. First, mice should be inoculated under an anæsthetic. Secondly, a number of mice should be used for each experiment; success will not necessarily come at the first attempt nor in every mouse. Thirdly, unfiltered, as well as filtered material should be used in the initial experiments.

Evidence that mice are susceptible to the viruses of human and swine influenza rests on the following facts:—

(i) Virus of ferret origin regularly produces in mice lung lesions not unlike some of those encountered in influenzal pneumonia in man.

(ii) After several passages through mice, the virus still produces the characteristic disease in the ferret.

(iii) Cultures of the lungs of infected mice on ordinary media are often sterile and do not in any case tend to yield growths of any particular organism.

(iv) Filtrates of infected mouse lungs through membranes having an average pore size of 0·6μ are infectious for other mice. This indicates, according to Elford's (1933) calculations, that the diameter of the virus is less than 0·3μ.

(v) The two viruses when isolated from mice are neutralised by the corresponding sera prepared in other animals.

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TREATMENT OF SCHISTOSOMIASIS WITH ACRIDINE COMPOUNDS

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IN THE LANCET of April 28th, 1934, A. C. Fisher published a note stating that cases of schistosomiasis can be cured in five days by the oral administration of acriflavine. If this proves to be true it will be a boon to millions of patients scattered all over the world. In Egypt alone 9,000,000 out of the 15,000,000 inhabitants are suffering from this disease. The present antimony treatment in the form of tartar emetic extends over an average of 29 days and necessitates attendance on the patient personally on alternate days to receive an intravenous injection. Faulty injection leads to grave complications, and the treatment itself is not free from danger. The treatment with Fouadin, which is an organic antimony compound, lasts on an average 19 days, and the patient receives nine intramuscular injections; this is a distinct improvement over the tartar emetic treatment, but is far from ideal.

Trypaflavine and the allied compounds have now been given an extensive trial in the Research Institute and the Endemic Diseases Hospital, Cairo: 81 patients received sufficient doses and were re-examined at the end of treatment and occasionally at intervals afterwards. The results show conclusively that these acridine derivatives have no curative effect on schistosomiasis due to *Schistosoma hæmatobium* or *S. mansoni*—a conclusion in agreement with the observations of Dr. A. Fakhry, described in a letter in THE LANCET of July 21st (p. 162).

The compounds and method of treatment tried were:—

1. Trypaflavine in solution given orally.
2. Trypaflavine given in capsules.
3. Trypaflavine intravenous injections.
4. Diamino-methyl acridine (May and Baker) in capsules.
5. Atebrin tablets by the mouth.

Acriflavine is a synonym of trypaflavine. The first is an English patent (expired) and the latter is a German patent. The formula is diamino-methyl-acridine chloride hydrochloride $C_{14}H_{14}N_3Cl.HCl$ = 296. 055. The diamino-methyl acridine supplied by May and Baker is a reddish powder, and according to the formula written on the label is not the chloride hydrochloride. On analysis it was found to contain chlorine. It is more soluble and has the same acridine basis. Atebrin is alkylamino-acridine dihydrochloride.

All the patients treated were adults. The diagnosis was based upon the microscopic examination of the excreta. The viability of the ova was ascertained by hatching before and after the treatment. In the cases of intestinal schistosomiasis the microscopic examination of a smear made from swabbing the rectum was resorted to, and occasionally sigmoidoscopic examination and taking a smear from the lesion was done. The cases treated as in-patients were given a laxative every night as advocated by Fisher. Varying doses were tried and also different means of administration. Fisher treated two cases with intravenous injections and 50 by the oral route. Adults received a maximum amount in the five days of 0·7 g. The result was a cure in 39 of his 52 cases. The resistant cases were mostly children who received proportionally smaller doses. Our results were as follows.

RESULTS

1. *Trypaflavine given in capsules.*—This is tolerated better than the solution. Various doses were given in the 53 cases treated. Of these 47 were suffering from *S. hæmatobium* infection and 6 from *S. mansoni* infection of the intestine.

A.—Seventeen cases with *S. hæmatobium* infection received a daily dose of 0·1 g. of trypaflavine in capsule for a period varying from 7 to 20 days, giving a total amount of 0·7 to 2·0 g. Microscopical examination of the urine at the end of the treatment showed living ova in all cases. Weekly examination was carried out in several of these cases after treatment for a period of 1–3 weeks with the same result.

* Prof. Khalil's qualifications and appointments are given in English works of reference under the name of Abdel-Khalik.

B.—Thirteen cases with *S. hæmatobium* infection received a daily dose of 0·2 g. of trypaflavine in capsule for 3–20 days, giving a total amount of 0·6 to 4·0 g. of the drug. At the end of the treatment there were living ova in the urine of all the patients. Re-examination was carried out at the end of the week in six cases, and all were positive for living ova except one. In this patient, however, only a single ovum had been discovered before and at the end of treatment.

C.—Five cases with *S. hæmatobium* infection received a daily dose of 0·3 g. of trypaflavine in capsule for 1–3 days; because of vomiting the dose was then reduced to 0·2 g. daily, and this was continued from 2–16 days. These cases received a total amount of 0·7 to 3·8 g. of trypaflavine, and in all of them living ova were found at the end of the treatment. One patient was re-examined a week later and living ova were again found.

D.—Twelve cases with *S. hæmatobium* infection received a daily dose of 0·5 g. trypaflavine in capsule for a period varying from one to two days. All the patients had severe vomiting. The daily dose was reduced to 0·3 g., and this was given for 1–4 days. Vomiting recurred in all cases and the dose was further reduced to 0·2 g. daily. This was given for 1–10 days. The total amount of the drug given in this series varied from 1 to 3·9 g. Examination of the urine at the end of the treatment revealed living ova in all cases. Five patients presented themselves at weekly intervals after the treatment, for 1–4 weeks, and living ova were found in all of them. One patient who received 3·9 g. of the drug developed fissuring of the nails of both hands. The nails became very loose and tended to separate from the underlying tissues.

E.—Six cases with *S. mansoni* infection of the intestine received a daily dose of trypaflavine 0·1–0·3 g. for 5–27 days. The drug was given in capsules, and the total amount varied from 1·5 to 6 g. Two of the cases had also a urinary infection with *S. hæmatobium*. The ova were unchanged at the end of the treatment except in one case which was found to be negative on two occasions; but re-examination two days after the end of the treatment revealed living ova. *S. mansoni* ova are not easy to find in the stools, especially if the infection is not severe.

2. *Trypaflavine in solution given orally.*—Three cases were thus treated. They received 20 c.cm. of a 2 per cent. solution in water daily—i.e., 0·4 g. This was not tolerated and caused vomiting, and the dose was reduced to 0·2 g. Living *S. hæmatobium* ova were found in the urine at the end of the treatment. In one case re-examinations were made weekly for two weeks after the end of the treatment with the same result.

3. *Trypaflavine given by intravenous injections.*—Fourteen cases, all infected with *S. hæmatobium*, were treated by this method.

A 2 per cent. solution was used and an injection of 10 c.cm. was given daily for 4–10 days. Each patient received 0·8 to 2 g. of the drug. Examination of the urine at the end of the treatment revealed living ova in all except the patient who received 2 g.; his urine, however, was negative after the fourth injection. Re-examination during the following 24 days revealed no ova, but they had been very few from the beginning.

Weekly re-examinations were made in seven cases for periods of 1–4 weeks. In one case living ova were always found. In two cases no ova were found on two successive occasions. In one case living ova were found after one week, and then no ova were found on the following week. In another case living ova were found after one week and no ova were found on the following week, and then ova appeared again one week later. In another case no ova were found 18 days after the end of the treatment and also after 25 days, but they appeared and were living at the end of one month. In the last case two weekly examinations revealed no ova, but living ova were found in the third week.

It may be noted that in this series the cases were not selected, and some of them had very few ova and this led to the occasional inability to find ova. Schistosoma ova do not pass regularly in the excreta. This question is studied and discussed in the Second Report of the Research Institute, 1932 (p. 31), and also in the Third Report, which is now in publication.

4. *Diamino-methyl acridine* (May and Baker) was used in seven cases:—

A.—Five cases of *S. hæmatobium* infection were given a daily dose of 0·1 g. in capsule. They received from 4–15 doses amounting to a total of 0·7 to 1·5 g. Microscopic examination of the urine at the end of the treatment revealed living ova in all of them.

B.—Two cases of *S. mansoni* infection were given capsules containing this drug. The first patient received 0·1 g. daily for 15 days and living ova were still passed at the end of the treatment. The second received 0·1 g. daily for seven days, and 0·2 g. daily for two days and 0·3 g. daily for six days (total of 2·9 g. in 15 days). Living ova were found at the end of the treatment.

5. *Atebrin* (alkylamino-alkylamino acridine dihydrochloride) was employed in four cases. Three received 0·3 g. daily for 16 days, and one received 0·4 g. daily for four days. The cases were infected with *S. hæmatobium*, and living ova were found in all of them at the end of treatment. A galactose liver function test at the end of treatment with 4·8 g. of atebrin showed no disturbance.

OTHER OBSERVATIONS

A symptom observed during the treatment with these acridine compounds was erythema of the face, appearing especially after injections of trypaflavine, and this led finally to desquamation. Vomiting occurred with the bigger doses of the drug; it was relieved by stomach wash. A few patients developed diarrhœa and a few collapsed. Two developed fissuring and incomplete separation of the nails. A liver function test with galactose was done after a course of 20 capsules (total 4 g. trypaflavine) in three cases. No disturbance in function was observed.

Fisher states that in in-vitro experiments the drug "was rapidly lethal to bilharzial cercaria in high dilutions in the presence of human blood-serum." Dr. Ali Hassan, biochemist of the Research Institute, found that cercariæ of *Schistosoma mansoni* lived for three hours in a dilution of 1 in 4000 trypaflavine in diluted human serum (in 2 of saline). Schistosoma ova in the urine of cases under treatment hatched when the urine was diluted with a weak solution of trypaflavine, and the miracidia remained living for two hours.

It may be stated that the observations of Fisher were made on cases infected with an undetermined species of schistosoma—as he says of the *hæmatobium-bovis* group. Although so far all species of schistosomes in man have reacted in the same way to drugs, the species treated by Fisher may be peculiarly susceptible to acriflavine.

CONCLUSIONS

Trypaflavine and other acridine compounds have been used in the treatment of schistosomiasis due to *S. hæmatobium* and *S. mansoni* without any curative effect. These drugs can be tolerated in fairly big doses extending over 20 days without damage to the liver functions. In vitro, in dilutions of trypaflavine corresponding to those produced by therapeutic doses in men, the cercariæ and miracidia of these two species of schistosomes can live for a fairly long time.

NOTES ON BRONCHOSCOPY

WITH EXAMPLES OF ITS APPLICATION

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This paper reports cases of certain diseases in which bronchoscopy has been employed with usefulness in diagnosis or treatment. Except for those of benign growth, which are rare, each of these examples is one of a large group.

BRONCHIAL CARCINOMA

Two cases are recorded as being typical of a condition which is commoner than is generally realised.

Case 1.—A. B., an engineer aged 59, was admitted to the Royal Chest Hospital under Dr. A. W. Stott on Sept. 18th, 1931. Symptoms: cough, old standing, but worse for five weeks; sputum scanty, but blood streaks twice; pain, dull and slight over heart on walking fast; dyspnœa on exertion for three months. He was a thin nervous man, in fair general condition, with clubbed fingers. The trachea was slightly to left, but there were no stridor, no glands, and no prominent veins. Chest: wasting and poor movement on left side; percussion note poor left upper lobe; vocal fremitus slightly diminished left upper lobe; breath sounds harsh and bronchial at left apex, absent or diminished over rest of lung. Sputum: no tubercle bacilli found; no cancer cells (Sept. 23rd); "one plaque of cells are suspiciously like carcinoma" (Sept. 26th). Radiography (Sept. 24th): complete collapse left lung, compensatory emphysema right lung; stenosis left main bronchus (Fig. 1).

Bronchoscopy.—Avertin. Mass filling left bronchus just beyond entrance. Red, irregular surface. Bleeds easily. Piece removed. Section: columnar-celled carcinoma, papilliform in structure, and very vascular.

Case 2.—C. D., a man aged 43, a gas fitter, was admitted to the Royal Chest Hospital under Dr. James Maxwell on Nov. 14th, 1928. Symptoms: well till August, 1925, when he had pleurisy on the right side; cough, persistent night and day; sputum, scanty but blood-stained; pain, over right clavicle, shooting to right ear; dyspnœa; night sweats; no hoarseness; no loss of weight. Examination: chest expansion good, no inequality; pulsation in lower part of neck below sternum; percussion note impaired right apex front and back; vocal resonance and vesicular murmur diminished right apex anteriorly, increased posteriorly. Sputum: no T.B.; "many cylindrical bronchial cells, some distorted and not ciliated . . . some groups of large cells of irregular shape which may have been shed from a growth." Radiography (Dec. 4th): appearances suggest a neoplasm of right upper lobe (Fig. 2).

Bronchoscopy.—Left bronchus normal. Right bronchus narrower, slit-like opening. No growth seen in either bronchus. Trachea shows slight indentation of the right wall just above bifurcation. No pulsation. No ulceration. No infiltration.

Exploratory thoracotomy (Mr. J. B. Hunter) Dec. 17th, 1928; piece removed; section showed no carcinoma.

Second bronchoscopy (Dec. 11th, 1930): avertin. Large lobulated mass to be seen at upper opening of right bronchus, protruding into trachea. Probably upper end of a large growth. Piece removed. Section: carcinoma; squamous cell type.

Of 20 consecutive cases sent for bronchoscopic examination with a strong presumptive diagnosis of bronchial carcinoma, 12 yielded specimens which were positive on microscopical examination, and 8 were negative. Of the 8 negative cases, it is fair to assume that some are mistaken diagnosis, and in fact one or two of them show a subsequent history which throws some doubt. The notes show that one of them underwent a tonsillectomy with benefit exactly three years after the original negative bronchoscopy! On the other hand, one case yielded no result with the bronchoscope and proved positive on exploratory thoracotomy, obviously a peripheral growth. Again, one case was negative in 1928 and positive in 1930. This case had been negative to thoracotomy in 1928.

Since the histological examination is the only conclusive test, and since the findings are positive in so large a percentage of cases, it follows that bronchoscopic examination of every suspected case is essential. The technical difficulties are not great except in cases of unwilling patients, and it is astonishing how few these are, even for repeated bronchoscopies.

In this series a routine examination was done for the presence of carcinoma cells in the sputum. It was negative in 14 cases, and only vaguely positive in 6. A characteristic report is "one plaque of cells suspiciously like carcinoma." In this same case the same pathologist (Dr. Norah Schuster) reports of the bronchoscopic specimen "columnar-celled carcinoma papilliform in structure and very vascular"—a strong contrast. The X ray examinations, which are invariably and repeatedly done in these cases, all show the mechanical changes which suggest a blockage of a bronchus by something, and carcinoma is mentioned as a definite diagnosis in 13 cases. Of these 13, 8 corresponded with a positive bronchoscopic finding. Of the remaining 5 positive on X ray but negative with the bronchoscope, 1 case showed presence of a peripheral growth on thoracotomy. In 4 cases which were positive by bronchoscopy, no suggestion of carcinoma was made by the radiologist.

In looking through these cases, it is manifest that by far the most important diagnostic method is the comprehensive clinical examination, but it is submitted that of the auxiliary methods, bronchoscopy holds at least as high a place as any other. It is not the purpose of this paper to discuss treatment of malignant growths, but it is evident that, whatever form this takes, bronchoscopy will be an essential part in establishing the necessary positive diagnosis and in introducing intrathoracic applications which seem to be a logical development.

BENIGN GROWTHS

Case 3.—E. F., a man aged 59, an accountant, was admitted to the Royal Chest Hospital under Dr. Stott. Symptoms: six months' increasing shortness of breath causing "gasping" on exertion; tightness of the chest, worse when bending over the chest at work; scanty sputum and an occasional clot of blood noticed in the sputum during last two or three years; no pain in chest; no dysphagia; loss of weight, one stone in two years. Examination: no physical signs of disease found in chest except that there appeared to be a slight impairment of note and weaker breath sounds over the left upper part of the chest in front; general condition fair; a suspicion of cyanosis; marked inspiratory stridor.

Bronchoscopy showed a smooth rounded growth moving very slightly with each respiration and apparently attached to the front of the trachea about an inch above the bifurcation. After applying adrenaline, the pedicle was defined and grasped with crocodile forceps and the growth was delivered with some difficulty through the glottis owing to its size (Fig. 3). Recovery was immediate and complete. Section: cellular fibroma.

Case 4.—G. H., a carpenter aged 24, admitted to the Royal Chest Hospital under Dr. H. B. Day in January, 1928. Symptoms: recurrent attacks of cough which started three years previously and were accompanied by hæmoptysis. General health good; nothing suggestive in family or past history. Chest: no impairment of movement nor of air entry; coarse rhonchi upper part left chest, intensified after coughing; distinct irritation behind inner end of the left clavicle. Sputum: no T.B.

Radiography: no evidence of pulmonary tuberculosis, bronchiectasis, or other diseases.

At a later visit he complained of irritating cough and hoarseness. This was found to be due to a papilloma which had made its appearance on the vocal cord. The papilloma was removed by operation and the hoarseness disappeared, but some eight weeks later the patient came back saying that he had coughed up some pieces of "gristle," and in October he had several attacks of slight hæmoptysis and some fever. A piece of the material coughed up was secured and on section proved to be a papilloma.

Bronchoscopy.—In November, 1928, multiple small papillomata removed from trachea, and a fortnight later by bronchoscopy is an interesting consideration. Certainly many benign tumours can be completely removed. Inflammatory masses can be reduced enough to promote drainage and influence secondary lung changes. Some tumours of lesser malignancy can on occasion be treated.

FIG. 1 (Case 1).—Radiogram showing collapse of left lung due to stenosis of left main bronchus. Lipiodol has filled the bronchial tree on the right, but has been held up on the left (as indicated by the white line).

FIG. 2.—Radiogram of chest in Case 2. Suggestive of neoplasm of right upper lobe.

FIG. 4 (Case 4).—Papilloma removed from bronchus (actual size).

FIG. 5 (Case 5).—Piece of mutton bone removed from bronchus (actual size).

the main growth was found and removed from the bronchus (Fig. 4). There was considerable relief until September, 1929, when symptoms and signs recurred. He was readmitted and a recurrent growth half an inch in diameter was removed from the left bronchus. Complete recovery followed this operation, and the patient was seen in January, 1931, apparently free from trouble.

This case may be regarded as a demonstration of the ease with which pieces of papilloma may implant themselves on mucous surfaces, after detachment from a parent growth.

FIG. 3 (Case 3).—Fibroma removed from bronchus (actual size).

Records of benign tumours of the tracheo-bronchial tree are rare, but it is doubtful if they are as uncommon as is generally assumed, and more frequent bronchoscopic examinations will probably reveal a much higher incidence. A comprehensive collection by Ellen J. Patterson as late as June, 1930, comprises 26 cases in all. Ten of these were diagnosed post mortem and 16 by the bronchoscope. Some of these cases could fall into the class of inflammatory swellings; but since the mechanical effects are the same it is practical to group them with the benign growths. The extent to which these growths may be removed

FOREIGN BODIES IN BRONCHUS

CASE 5.—I. J., a man aged 38, was admitted under Dr. Lisle Punch to the Royal Northern Hospital. In June, 1932, he had "swallowed the wrong way" while drinking soup containing mutton bones. Two days later the chest was sore and he was seen by his doctor. X ray report in July was "bronchitis." Patient then went back to work. Since then the condition has remained the same—i.e., occasional pain in the chest, coughing attacks, and plentiful yellow sputum. No blood. No loss of weight. Sleeps well and does his usual amount of work as a motor mechanic. Previous history: pleurisy four years ago; said to have had chest trouble during the war. Chest: good movement; no abnormality of percussion note; air entry good; a few crepitations at left base in front, and in the right axilla, wheezing râles and crepitations and tubular breathing; vocal fremitus normal. There was a large dental abscess in connexion with a left upper molar root and quantities of pus discharged from the cavity. This focus was probably responsible for a large proportion of the pus brought up.

Bronchoscopy.—Avertin. After extraction of the dental root and cleaning up of the gum sepsis a large piece of mutton bone was removed from the distal end of the right bronchus. Recovery was complete and immediate.

The foreign body in this case (Fig. 5) was of considerable size, but owing to the length of time it had been in the lung it had become decalcified, and did not show on the skiagram (Fig. 6). The photograph shows inadequate entry of lipiodol into the bronchial passages of the right lung. The history and the clinical examination made the diagnosis fairly certain.

LUNG ABSCESS

CASE 6.—K. L., aged 35, a cowman. Admitted to the Royal Chest Hospital on Jan. 20th, 1930, under Dr. Maxwell. Symptoms: four weeks before admission he had sharp stabbing pain in the right side of the chest made worse by breathing and coughing; cough increased and he began to bring up copious brown frothy sputum

which was tough and offensive; since then his progress has been "up and down"; there is slight dyspnœa and night sweats. Sputum: no T.B. Radiography (Dec. 30th, 1930): abscess posterior part of the right lower lobe at the level of the seventh interspace behind; lipiodol has not got into cavity (Fig. 7).

Bronchoscopy (Jan. 2nd, 1931): pus aspirated. Two days after the bronchoscopy the abscess was evacuated through the bronchus. See temperature chart (Fig. 9). Radiography (Jan. 27th): considerable fibrosis right lower lobe, dilated bronchi, no definite abscess (Fig. 8).

SYPHILITIC TRACHEAL STENOSIS

CASE 8.—O. P., a woman aged 47, was admitted to the Royal Chest Hospital on Feb. 21st, 1933, under Dr. Saxby Willis. Symptoms: cough and mucopurulent sputum three years; occasional streaking; increasing dyspnœa; marked stridor. On admission nothing abnormal was found in heart and lungs, except defective movement of the right diaphragm and dilated veins in the right upper chest. Sputum: no T.B.; no cancer cells. Wassermann examination: strongly positive. Laryngoscopy (Feb. 16th): larynx normal; clot of blood seen on wall of trachea about one inch subglottic; probably tracheal stenosis.

Bronchoscopy (Feb. 23rd).—Avertin. Narrow stenosis of trachea about 20 cm. from front upper teeth. "It is caused by lesions within the trachea, but ? accentuated by pressure from outside on the left. Tracheal lesions are granulomatous especially on soft posterior wall. Multiple. Difficult to get a specimen without endangering the safety of the tracheal wall. Probably syphilitic." Section: tissue covered with stratified epithelium, under which is cellular infiltration suggesting inflammation, but there is no indication as to nature. No tubercles; no vascular changes; no evidence of new growth.

This is a very unusual case in which an exact diagnosis has been made. Early treatment is bound to have a profound influence on its course. The changes which would have occurred as a sequel to the very high obstruction would have been important and extensive. In this case the Wassermann reaction was suggested by the bronchoscopic findings.

FIG. 6 (Case 5).—Lipiodol has not entered the bronchiolus of the right side. There is obstruction in the right bronchus by a piece of bone.

FIG. 7 (Case 6).—Abscess in right lower lobe. No lipiodol enters the cavity.

FIG. 8.—Condition 26 days after bronchoscopy. No definite abscess visible.

As is to be expected, it is unusual to be able to penetrate into the abscess cavity itself because of the surrounding fibrosis. Nevertheless the emptying and dilatation of the surrounding bronchi is of paramount importance, as is shown by this case. The relation between bronchoscopy and evacuation of an abscess has been repeatedly demonstrated. Even in cases where the abscess is peripheral, it is of the greatest help to establish drainage of the bronchi by bronchoscopy.

ASTHMA

CASE 7.—M. N., a schoolboy aged 13. Despite treatment with old tuberculin which had caused some improvement he was having attacks of asthma every day. Bronchoscopy was done under avertin on March 5th, 1931. "Mucosa normal. Bronchi filled with mucoid secretion. This was aspirated and the larger bronchi dilated with forceps." On the 6th he had a fair night; he began to wheeze, but did not have a definite attack and it ceased quite suddenly, which was not the experience in previous attacks. March 27th: keeps free from attacks. April 4th: attacks last three nights.

There are cases of pure asthma in which the continual attacks seriously undermine the patient's general condition. The reported case shows that bronchoscopy can definitely give a much needed rest. Whatever the causative factors be, there is no doubt that in asthma the presence of thick gelatinous plugs of mucus in the bronchial openings plays an important part in the frequency and severity of the attacks. These plugs can be aspirated by the aid of a powerful suction pump. A difficulty is encountered in these cases—namely, that patients who have been under treatment a long time have often been heavily dosed with sedatives, and it is difficult, by premedication, to get them into that condition of mental calm which is desirable for satisfactory bronchoscopy under local anæsthesia.

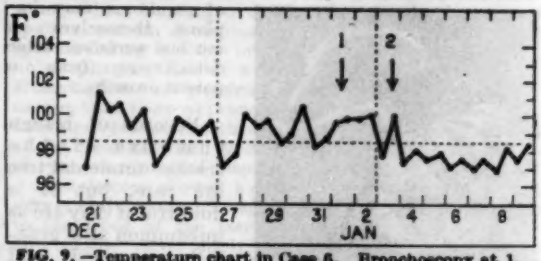

FIG. 9.—Temperature chart in Case 6. Bronchoscopy at 1. Abscess evacuated at 2.

I may add in conclusion that many cases of bronchiectasis are very materially helped by periodical aspiration.

I am much indebted for permission to publish these cases to the physicians who have referred them to me, and to Dr. Peter Kerley for his radiograms.

THE NATURE AND TREATMENT OF ACUTE OSTEOMYELITIS

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For many years my treatment of acute osteomyelitis was conservative and somewhat unorthodox. The majority of patients presented themselves in hospital with pus under the periosteum. I evacuated the pus and did not interfere with the bone. Many patients required secondary operations for removal of sequestra. The great majority made good recoveries after illnesses of varying duration. In the occasional early case pus was sought for in the bone, according to text-book instructions, but results were perhaps less happy. An average of two or three cases a year did not stimulate me to take any particular interest in the subject.

In the year 1928, when perusing the *Proceedings* of the Royal Society of Medicine,[1] I was staggered to read the following mortality figures from a well-known London hospital quoted at a discussion on the treatment of acute osteomyelitis:—

	Recovered.	Died.	Total.
Femur	1	5	6
Tibia	3	1	4
Fibula	1	2	3
Humerus	3	2	5

The surgeon who quoted these figures advocated an extensive guttering operation. My interest was aroused, and from that time I have devoted much time and thought to the subject. The conclusions I have reached are embodied in this paper.

Before proceeding it is only fair to state that, at a later discussion at the Royal Society of Medicine,[2] there were many advocates of more conservative methods. Others, however, stoutly maintained their belief in drastic surgery.

NATURE OF OSTEOMYELITIS

Scientific treatment of any disease should be based on a sound conception of its nature. Mastoid disease, for example, is a local extension from the middle ear, and eradication of all infected bone will prevent spread to the system. Acute osteomyelitis, in my opinion, is a local manifestation of a systemic infection, which may be so virulent as to kill the patient within a few days or so mild as to result only in the formation of a Brodie's abscess. There is nothing new in this proposition, but I will illustrate it by quoting three cases. Its application as a basic principle appears to have been neglected.

Cases 1 and 2. *Acute staphylococcal septicæmia.*—1. A boy, aged 14, at a large public school, reported sick one Saturday night, feeling unwell and complaining of pain near the knee. On Sunday there was a little local tenderness. On Monday morning he was seen in consultation. His temperature was 104° F. and pulse-rate 140. He seemed to be slightly delirious. There was a somewhat tender, red, œdematous area over the head of the left tibia. An unfavourable prognosis was given. Conforming with orthodox treatment, the tibia was explored with a very small gouge. Serum only was obtained. Culture from this gave a profuse growth of *Staphylococcus aureus*, and the same organism was recovered from the blood. The patient died within 48 hours.

2. A well-built public-school boy, aged 17, had recently suffered from a large boil on the forearm. On Tuesday he did not feel well and complained of pain in the chest and thigh. On Thursday he was seen by a doctor; his temperature was high and respirations were rapid. Influenza was suspected. On Saturday the chest condition was clearing up. The right thigh was swollen and tender high up in the adductor region. His temperature rose to 104° at night and he became delirious. He was seen in consultation on Sunday and an operation was performed. An incision was made high up in the adductor region and some deep-seated pus evacuated. Patient was not relieved by the operation. Two days later he had signs of acute septic pneumonia and also acute cystitis. He died three days after the operation.

Case 3. *Staphylococcal septicæmia with late formation of bone abscess.*—A man, aged 41, was admitted to hospital complaining of abdominal pain and vomiting, and also of severe headache. He had suffered from boils for some months. His illness had started, eight days before admission, with a shivering attack followed later by diarrhœa and vomiting. His temperature on admission was 102·6°, rising next evening to 104°, and falling to normal in the course of a week. No abnormal physical signs were elicited. *Staphylococcus aureus* was recovered from the blood a few days later. He remained in hospital about six weeks. Five months later he was readmitted complaining of aching pain in the left leg, which had been present for some weeks. Radiography showed an abscess cavity in the shaft of the fibula. This was dealt with by operation.

It is of course common knowledge that, even after efficient drainage of an infected bone, the temperature may continue high. Pyæmic abscesses may appear in different parts of the body after an interval of months or even years.

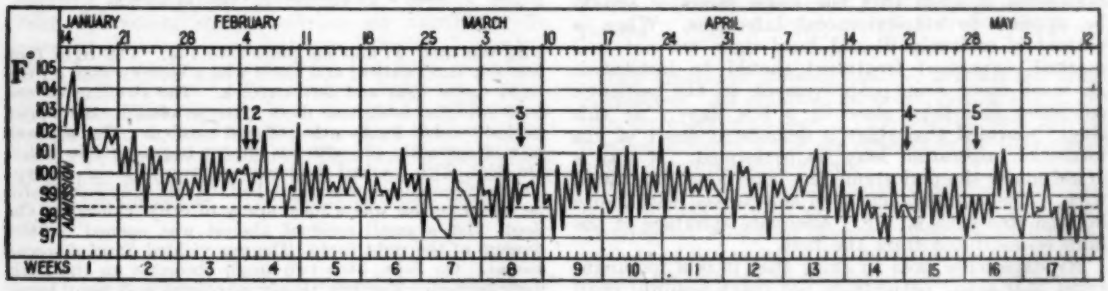

FIG. 1 (Case 5).—Temperature chart from January to May. 1=radiographed. 2=application of abduction frame. 3=removal of abduction frame; application of Thomas's splint. 4=removal of Thomas's splint. 5=application of plaster spica.

EARLY OPERATION

Writers of modern text-books agree that acute osteomyelitis is a blood-borne disease. In no book that I have consulted is any delay in operative

treatment countenanced once a diagnosis has been made. The extent of the operative interference advised appears to vary from incision of the periosteum to guttering of the bone. Starr, writing in the "Practice of Surgery," [8] says:—

"Immediate treatment should be instituted as soon as a diagnosis has been made. . . . The first principle of treatment is to relieve the tension beneath the periosteum and in the cancellous area of affected bone."

That early operation does not cut short the general septicæmia is well illustrated by the following case:—

CASE 4.—On June 10th, 1929, a boy aged 8, living under the best conditions, was seen in consultation. A month previously he had had a boil on the thigh. On June 8th he complained of pain above the left knee. On June 9th the pain was worse and he was kept in bed. On June 10th his morning temperature was 105° F. and the pulse- and respiration-rates were rapid. The left knee was held semiflexed. Considerable pain was caused by deep pressure in the region of the adductor tubercle. Acting on accepted principles, immediate operation was undertaken. The popliteal surface of the femur was exposed and a little sero-pus found under the periosteum. A small hole was made into the cancellous bone, revealing small foci of pus. The wound was drained. Two days later there was no pain in the knee, but the patient's temperature ranged about 102° F. with a pulse-rate of 140. On June 16th the temperature was 102° F., the pulse-rate 120, the respiration-rate 44. A subcutaneous abscess had developed in the forearm and there was arthritis of the left elbow. Pyrexia continued at a lower level. On July 31st sero-fibrinous fluid was evacuated from the right elbow-joint. In December an abscess had formed in the lower end of the right tibia. In March, 1930, sero-pus was evacuated from the left shoulder-joint. To cut a long story short, this boy continued, with only brief apyrexial periods, to show an evening rise of temperature to about 100° or 101° for over four years. During that time he underwent many minor operations at the hands of various surgeons. The worst complication was an infection of the left knee-joint which ended in ankylosis. The patient is now, more than four and a half years after the onset of his illness, beginning to get about.

CONSERVATIVE TREATMENT

At one time it was customary in streptococcal empyema for operation to be carried out as soon as pus was discovered. The majority of the patients died. Later, more conservative measures came into vogue, patients had a chance to develop some degree of immunity, and many lives were saved. It is my considered opinion that the same principle should be applied to staphylococcal infections. When a patient is seriously ill and local signs are not well marked, expectant treatment should be instituted. In most cases some improvement in the patient's condition will take place in a few days. At this stage, provided that there is definite evidence of pus formation, operation may be performed. If pus is found under the periosteum the bone is not interfered with. The wound is left open and packed with gauze impregnated with B.I.P.P. Adequate splintage of the limb is instituted from the first.

My experience goes to show that it is a fortunate event that many patients do not reach hospital until they have been ill for a week or more and obvious pus is present. Some of these patients will have developed sufficient immunity to withstand extensive guttering of the bone or even diaphysectomy. These will furnish sufficient brilliant recoveries to encourage the advocates of heroic surgery. Others succumb after operation

The following cases illustrate the results of conservative treatment:—

CASE 5.—A boy of 15 was admitted to hospital on Jan. 14th, 1932. Ten weeks previously he had had a boil on the neck. Three days before admission he had a bad headache, followed by pain in the upper part of the right thigh which had become steadily worse. On admission his temperature was 102° and pulse-rate 104. He was a thin boy, and in considerable pain. Any movement of the right hip-joint caused pain, and there was some fullness to the outer side of the upper end of the sartorius with tenderness on pressure. Expectant treatment was instituted. At first a Liston's splint was used to steady the limb, and on Feb. 5th an abduction frame was substituted. His temperature was then on the down grade and pain was less. On March 7th a Thomas's knee-splint was substituted for the abduction frame and was removed on April 21st, when there was no pain but fibrous ankylosis of the hip-joint. X ray examination showed much thickening of the upper half of the femur. A plaster spica was applied on April 29th and removed on June 18th. The patient's condition was then good, and he was gaining weight.

On Jan. 7th, 1933, a small abscess had formed in the upper part of the thigh, 4 inches below the anterior superior iliac spine. On Jan. 10th the abscess was opened and a little necrotic material evacuated. A sinus appeared to lead to a small cavity in the outer side of the bone.

This case is noteworthy in that, in spite of extensive periosteal thickening and ankylosis of the hip-joint, there was no pus formation until a year after the illness started. The abscess which formed then was trivial. I feel sure that early operation would have made matters much worse and might have been fatal.

CASE 6.—A boy, aged 12, was admitted to hospital on Sept. 13th, 1933. Three days previously the right foot had begun to swell and itch. On admission his temperature was 103° F. and his pulse-rate 144. The right foot was red and swollen, and there was a blotchy rash on the right upper arm and left buttock. The swelling of the foot subsided and, two days after admission, the upper half of the left leg became red and swollen. The boy was now desperately ill, with an almost imperceptible pulse. On Sept. 20th I asked the house surgeon to incise the leg. The boy's condition was still so bad that the only anæsthetic he dared to use was a local spray of ethyl chloride. On Sept. 21st a small residual abscess was opened on the dorsum of the right foot. The pus yielded *Staphylococcus aureus*. On Sept. 24th two small abscesses on the back were opened. The boy slowly recovered and went home on Dec. 12th. Radioscopy showed much periosteal thickening of the tibia, and there is still a small sinus. There is also a small sequestrum in the head of the third metatarsal.

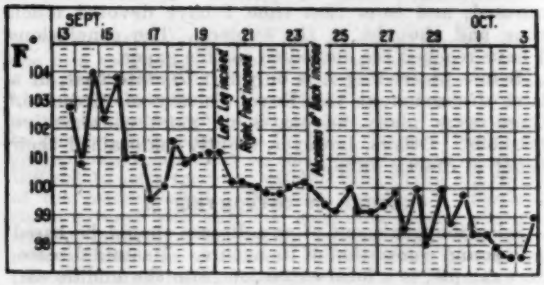

FIG. 2.—Temperature chart in Case 6.

CASE 7.—A boy, aged 4, who had been ill at home for three weeks, was admitted, for what reason I know not, to the medical side of the hospital. He had complained of pain in the right groin for three weeks and swelling for a few days. On admission his temperature was 100° F. and his pulse-rate 160. The right thigh was held abducted and movement caused pain. Radiography showed an area of necrosis in the neck of the femur. His temperature

fell to normal in two days. I saw him a week after admission, incised an abscess in the upper part of the thigh, and fixed the hip-joint in plaster. The pus from the abscess yielded *Staphylococcus aureus*. The sinus healed in a few weeks. The plaster was removed at the end of six weeks and soon afterwards he went home. Now, three months later, the sinus is still healed. X ray examination suggests that a small sequestrum may be in process of absorption.

The value of a system of treatment must be judged by results. Osteomyelitis is not sufficiently common to allow opportunity for any individual surgeon to treat an adequate number of cases. Before quoting figures my attitude with regard to treatment requires a word of explanation.

For many years before I had heard of Dr. Starr it was my custom to refrain from opening the bone if pus was under the periosteum. The force of traditional teaching was so strong that, until about two years ago, in cases seen early I penetrated the bone in search of pus. This, I am now convinced, is wrong when the patient is seriously ill. From the last ten years I have records of 31 personal cases, with 3 deaths. Two of these deaths occurred in cases of acute septicæmia already recorded. As in both cases early operation was performed, they cannot be used in argument against expectant treatment. Death would probably have occurred in any event. The other fatal case was a girl, aged 8, who had been ill for a week before admission with osteomyelitis of the humerus. Pus was evacuated by a periosteal incision. Later she developed acute suppurative arthritis of the hip-joint which proved fatal.

In this series of cases, omitting the two cases of fatal septicæmia, the bones primarily affected were as follows:—

Femur ..	10	Tibia ..	9	Humerus ..	2
Fibula ..	1	Radius ..	2	Ulna ..	1
Clavicle ..	1	Os calcis ..	1	Pelvic bones	2

In 4 cases an abscess had burst or been opened before admission. In every one of these cases an operation was performed for removal of a sequestrum. In the remaining 25 cases the primary operation was: in 18, simple incision of the periosteum; in 2, exploration of the bone in search of pus; in 5, evacuation of a localised abscess in the bone. In the majority of the cases one or more secondary operations were required for removal of sequestra, usually small. Such operations should involve no mortality. In cases in which a joint becomes infected I employ, with good results, irrigation of the joint as recommended by Cotton.[4] The series includes two adults. One (Case 3) has already been mentioned. The other case is a nurse, who developed a small abscess in the cortex of the femoral shaft. This was an interesting case, but perhaps should not be classed as one of acute osteomyelitis. The same criticism applies to Case 3.

SUMMARY

(1) Acute osteomyelitis is a local manifestation of a systemic infection and should be treated as such. (2) In the early stage of the disease expectant treatment should be instituted until there is definite evidence of pus formation. (3) In most cases incision of the periosteum is all that is necessary at the primary operation.

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2. Ibid., 1931, xxv., 517.
3. Starr, C.: Practice of Surgery, London, 1927, vol. ii., p. 22.
4. Cotton, F. J.: Jour. Bone and Joint Surg., 1926, xxiv., 395.

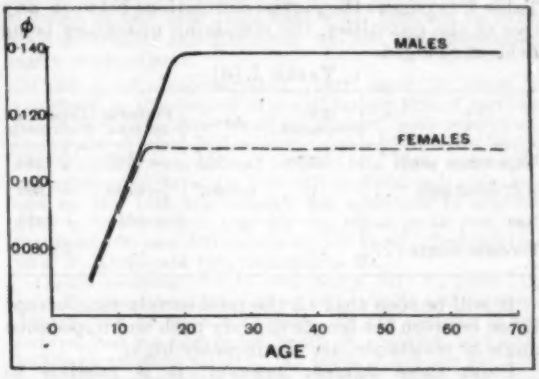
THE IMPEDANCE-ANGLE TEST FOR THYROTOXICOSIS

A STUDY OF THE IMPEDANCE ANGLE IN THE NORMAL CHILD

BY M. A. B. BRAZIER, Ph.D., B.Sc.

(From the Central Pathological Laboratory of the London County Mental Hospitals)

THE impedance-angle test having proved of value in the diagnosis of toxic conditions of the thyroid gland in adults,[1] it is proposed to extend this method to the investigation of the occurrence of goitres in children. A preliminary study of some normal children revealed the fact that the impedance angle is high in childhood and apparently decreases with increasing age. It became quite clear that before the impedance-angle test for thyrotoxicosis could be applied to children, an extensive study must be made of the normal child at different ages so that normal values could be established.



The following study of a group of children of both sexes between the ages of 6 and 14 was therefore undertaken to set up the normal standards. In a previous work [2] it has been shown that in the normal adult there is a marked difference in the mean value for the impedance angle for each sex. Recent figures * indicate these means to be:—

Males .. (35) $\phi = 0{\cdot}138_0 \pm 0{\cdot}002_2$
Females .. (35) $\phi = 0{\cdot}110_0 \pm 0{\cdot}001_7$
Standard deviation = $0{\cdot}012_0$, $0{\cdot}010_1$
($\phi = \frac{1}{2}$ π–impedance angle.)

This difference between the two sexes is not found in children. All children, however, give a low ϕ, but this increases with age. The general form for the relation between ϕ and age appears to be that shown in the accompanying Figure.

The low ϕ—i.e., high-impedance angle—of children is of interest in view of the work of Cooper [3] whose histological study of human thyroids at different periods of life revealed the resemblance of the histological picture of the adolescent gland to that seen in thyrotoxicosis. As has been previously shown [1 4] high-impedance angles are associated with thyrotoxicosis. The basal metabolic rate of children is also high, and decreases with age (Boothby and Sandiford [5]), but in this case there is also a sex difference.

One might at first suppose the decrease of impedance angle with age to be due to the change in the physical

* These figures may be taken as more reliable than those published in a previous paper.[2] The earlier values for the means include a slight error due to earth capacitances. The figures given above represent the true means at a frequency of 20,000 cycles per second.

dimensions of the child. A detailed study, therefore, of a group of 41 normal children between the ages of 6 and 14 was undertaken for the purpose of determining what physical factor, if any, was predominantly responsible in determining the value of the impedance angle.

For this group of children there were recorded the values of the impedance angle, resistance (to alternating current), age, forearm length, and elbow to elbow measurement. The forearm length may be taken as a rough indication of the area of the arm immersed in the saline electrode, while the elbow to elbow measurement represents approximately the length of the electrical path through the body. When these various relations were plotted as graphs there was seen to be a marked tendency for several of the pairs of properties to vary in a related manner.

A statistical analysis of the data was therefore made in order to determine which of these apparent correlations was in fact the true one. The correlation coefficients for the various possible relationships are given in Table I. Table I. (*a*) shows the total correlation coefficients for the data as observed, while Table I. (*b*) shows the partial correlations between any two of the quantities, the remaining quantities being held unchanged.

TABLE I. (*a*)

—	A.C. resistance.	Age.	Forearm length.	Length of body path.
Impedance angle .	+·6135	—·5825	—·4582	+·0244
A.C. resistance ..	..	—·6907	—·6499	—·1696
Age..	..	..	+·8656	+·9423
Forearm length ..	..	..	..	+·8259

It will be seen that all the total correlations, except those between the length of body path and impedance angle or resistance, are significantly high.

From these figures, however, it is possible to calculate the partial correlation coefficients which exhibit the correlation between any two variables on the basis that all the other variables are held constant. In this way there is eliminated the risk of attaching significance to a total correlation which is only the result of two successive partial correlations. The partial correlation coefficients are given in Table I. (*b*).

TABLE I. (*b*)

—	A.C. resistance.	Age.	Forearm length.
Impedance angle ..	+·381	—·314	+·179
A.C. resistance ..	..	—·172	—·198
Age	..	..	+·767

These partial correlation coefficients show that apart from the high correlation between age and forearm length which is to be expected in normally growing children, the only coefficients which do not become negligibly small on analysis are those between impedance angle and age and between impedance angle and resistance. The connexion between impedance angle and resistance may suggest that the reactive component is holding constant and that any change in impedance angle is only due to a corresponding change in resistance. This, however, can be disproved by a statistical study of the partial regression coefficients.

The result, therefore, shows that the change of impedance angle with age cannot be attributed to some superficial factor such as the increase in the size of the arm immersed, or the increase in size of the body traversed by the current, but must be due to some physiological change taking place with increasing age. This independence between impedance angle and the shape and size of the dielectric is a confirmation of the view already put forward [2] that the dielectric under observation cannot be the skin alone, and that the impedance angle must relate in some way to the body as a whole treated as a dielectric.

SUMMARY

In order to extend the use of the impedance-angle test for thyrotoxicosis to the diagnosis of thyroid dysfunction in children, a study has been made to set up the normal standards for children of both sexes.

This research was carried out under the direction of Dr. F. L. Golla to whom the author's thanks are due. The author is also indebted to Dr. M. Creak and Dr. F. Pilkington, of the Maudsley Hospital, for the opportunity to examine this group of children, and to Dr. L. G. Brazier for help and advice in the statistical analysis.

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Clinical and Laboratory Notes

TUMOURS OF THE TESTIS IN TWO BROTHERS

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MALIGNANT disease is uncommon in the testis compared with other regions of the body. Tanner [1] found that a testicular neoplasm occurred once in every 2000 males admitted to hospital; Southam and Linnell [2] state that it occurs once in every 1500 males admitted to hospital with a surgical condition. This being so, it must be exceedingly rare to encounter it in two members of a family; and in fact I have not been able to find a record of this happening except in uniovular twins.

CASE 1.—I am indebted to Mr. C. H. Fagge for allowing me to publish this case which was under his care at Guy's Hospital. The patient, a male aged 18, was admitted in June, 1923, for a right inguinal hernia which was successfully operated on. Some four weeks later he noticed that his right testicle began to enlarge, and in January, 1924, when he was readmitted, it was the size of a cricket ball, hard and trilobed. A large hard lymphatic gland was palpable immediately below the spine of the os pubis. There was a large mass in the right iliac fossa which could be traced upwards along the midline above the umbilicus to the liver. The superficial veins of the abdomen were conspicuous, and there was swelling of the right lower limb. The patient was obviously beyond the aid of surgery, and he died at the age of 19. A microscopic section of the tumour is not available.

CASE 2.—A brother of the first patient, at the age of 38, was seen complaining of swelling of the left testicle. In July, 1933, he noticed that it was increasing in size, and there was a dull pain in it. The swelling became much larger during the subsequent nine months. There was no history of venereal disease, and

[1] Tanner, C. O.: Surg., Gyn., and Obst., 1922, xxxv., 565.
[2] Southam, A. H., and Linnell, E. A.: Brit. Jour. Surg., 1923, xi., 223.

the Wassermann and Sigma reactions were negative. The patient looked well, and nothing abnormal could be discovered in inguinal regions or abdomen. The skin was reddened on the anterior aspect of the scrotum and the left side of the scrotum was enlarged. The right testis was normal, but the left was enlarged, hard, and irregular in surface. Testicular sensation was much diminished but not absent, the spermatic cord appeared normal, but there was a small hydrocele of the tunica vaginalis, which yielded blood on paracentesis. A left orchidectomy was performed on May 2nd, 1934, the spermatic cord was excised as far as the internal abdominal ring. Deep X ray therapy was given to the lumbar lymphatic glands, and the patient made an uninterrupted recovery, being well at the time of writing. Prof. E. H. Kettle kindly examined sections taken from various parts of the tumour, and reports that they show the typical appearances of a seminoma of the testis; there is no evidence of any teratomatous elements.

Champlin [3] has recorded similar tumours of the testicle in identical twins. The right testis was affected in each case and both tumours were sarcomata. Other neoplasms which are reported having occurred in twins are adenocarcinoma of the uterus, papilloma of the larynx, retinoblastoma, fibro-adenoma of the breast, tumours of the cerebellum and cerebrum. Discussing the hereditary factor in the genesis of tumours Piney [4] draws attention to these possibilities. In the first place tumours might be inherited and the offspring born with neoplasms. Secondly, a tumour diathesis might be transmitted, a neoplasm manifesting itself later on in life. Thirdly, there may be a hereditary reduced resistance to those forces which cause tumour-formation. The inheritance of tumours is seen in von Recklinghausen's disease, which is often familial in its incidence and usually appears to be heritable. The disease known as polyposis of the colon is well established in having a familial incidence, but is not proven to be hereditary. It is very probable that polyposis of the colon will occur in all offspring of those afflicted with the disease.

ACUTE PERIVASCULAR MYELINOCLASIS "ACUTE DISSEMINATED ENCEPHALO-MYELITIS"

A REPORT OF TWO FURTHER CASES ASSOCIATED WITH EXANTHEMATA

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IN a previous communication (Marsden and Hurst) [1] details have been given of 7 cases of acute perivascular myelinoclasis which occurred amongst 11,408 cases of small-pox treated in the London County Council small-pox hospitals between the beginning of 1928 and the end of the third quarter of 1931. An account of a case which occurred at Stoke-on-Trent in April, 1930, reference to the Willesden case (Troup and Hurst),[2] and a discussion on the ætiology of the condition and on its association with acute fevers and the exanthemata, together with a review of some of the literature, were included in this paper. More recently Wyllie has given a summary of some of the salient features of this form of encephalomyelitis.

Though happily a rare condition, even following primary vaccination, which has preceded it in most of the recorded cases, acute perivascular myelinoclasis has of late years been superimposed upon an attack of measles (as described by Greenfield),[3] with a frequency which cannot be disregarded, despite the enormous number of young children who pass through an attack of this disease without nervous involvement.

Since October, 1931, 2449 cases of small-pox have been treated in the small-pox unit of the River Hospitals, and one further case of acute perivascular myelinoclasis has occurred. Nervous symptoms commenced in this patient on Feb. 16th, 1934, and he died 48 hours later. At this time, in the midst of London's most recent biennial measles epidemic, other and separate units of the River Hospitals contained about 900 patients who were suffering mainly either from scarlet fever or measles. On Feb. 20th, two days after the death of the above patient, a child aged 5 years was admitted to one of these units with a fading measles rash and in the early stages of an attack of encephalitis. About 30 hours later she also was dead of acute perivascular myelinoclasis.

In my small experience of this condition (ten cases) I have noted, as features not without epidemiological interest, that cases tend to occur during the early months of the year, and that each appears to arise spontaneously, though more or less contemporaneously with others.

CASE 1.—An unvaccinated youth, aged 17 years, a van guard in the employ of a well-known firm of carriers, was known to have been in contact with small-pox. Symptoms of onset of the disease, pains in head and limbs, and vomiting were noticed on Feb. 6th, 1934, and on the two subsequent days. On Feb. 9th the focal rash appeared, and on the 14th the patient was admitted to hospital with a well-marked pustular modified small-pox rash (between 100 and 500 lesions on the face). Temperature 98·4° F., pulse-rate 100, respirations 20.

On the morning of Feb. 16th (temp. 101° F., pulse 112, resp. 20) the patient complained of headache and appeared drowsy, but he took his meals. In the evening it was noticed that the boy had difficulty in speaking, and urine had been retained all day. At about 3 A.M. on the 17th he became unconscious (temp. 101·6° F., pulse 120, resp. 24). Twenty ounces of urine, which contained no abnormal constituents, was removed by catheter. All limbs were flaccid with absent reflexes; pupils were equal, somewhat contracted, and reacted to light. The patient became incontinent of fæces. At 3.30 P.M. (temp. 102·4° F., pulse 128, resp. 24) 30 c.cm. perfectly clear fluid, which escaped readily by drops, was removed by lumbar puncture, and 20 c.cm. convalescent small-pox serum injected intrathecally: 25 c.cm. of this serum was also given intramuscularly. The patient moved slightly at the insertion of the needle; the corneal reflex only was obtainable; nasal feeds were given. At 10.30 P.M. the temperature was 103·8° F., the pulse-rate 128, and the respirations 24—the commencement of terminal hyperpyrexia. Fifteen ounces of urine, which contained some albumin, was withdrawn.

On the morning of Feb. 18th the temperature was 105° F., at which level it remained until death (pulse 132, resp. 56). The patient was in deep coma, breathing stertorously. Twenty-one ounces of urine, containing some albumin, was removed by catheter, and a further 20 c.cm. convalescent small-pox serum given intramuscularly. There had been no further action of the bowels. At 2.15 P.M. cyanosis was marked and respiration stertorous and irregular; the respiratory passages were full of viscid secretion; trismus was absent. Lumbar puncture was repeated and blood-stained fluid (trauma) withdrawn. At 3.15 P.M. the boy was in extremis, deeply cyanosed; and at 3.30 P.M. death occurred by respiratory failure.

At the post-mortem examination on the following day no striking macroscopic changes were observed. Sections prepared and reported on by Dr. J. E. McCartney show in the region of the basal ganglia an infiltration with mononuclear cells, which are most numerous around the blood-vessels; in addition there are some macrophages and a few polymorph cells. Weigert-Pal preparations of

[3] Champlin, H. W.: Jour. Amer. Med. Assoc., 1930, xcv., 96.
[4] Piney, A., in The Chances of Morbid Inheritance (edited by C. P. Blacker), London, 1934.

this neighbourhood show a very vascular infiltration and a slight amount of perivascular demyelination, which is also seen in the cortex. Sections of the pons show slight areas of perivascular demyelination; and in the cord also small scattered areas of this condition are seen. Evidence of early pneumonia is present at the base of the left lung.

CASE 2.—A girl, aged 5 years, was admitted to hospital on Feb. 20th, 1934, with a history of having suffered from headache, backache, pains in limbs, and vomiting on Feb. 17th. A rash had been noticed on the same day. She had not spoken since the evening of the 19th, but had lain "like a log"; salivation and constipation had also been noticed.

On admission to hospital (temp. 100·4° F., pulse 128, resp. 32) the patient presented a fading measles rash; she was semi-conscious but could be partly roused, and was salivating markedly; pupils were equal, dilated, and reacted to light; limbs were quite flaccid, but at times a spastic tremor of the arms was noticed; neck rigidity was absent; both plantar responses were extensor. At 6 P.M. clear cerebro-spinal fluid was removed by lumbar puncture. At 10 P.M. temp. 102° F., pulse 128, resp. 32.

On Feb. 21st the patient was unconscious but could be roused by painful stimulation (temp. 102·4° F., pulse 172, resp. 56). Limbs were flaccid, pupils equal and reacted to light; abdominal reflexes were absent; Babinski's sign remained positive. At 3.30 P.M. homogeneously blood-stained fluid (trauma) was removed by lumbar puncture; 8 c.cm. whole blood from a convalescent measles patient was injected intramuscularly, and sodium salicylate and glucose given intravenously; trismus was marked. At 8.30 P.M. the temperature was 105° F., the pulse-rate 180, and respirations 60 (terminal hyperpyrexia); the patient was in coma with dyspnœa and bubbling mucous râles; she was doubly incontinent. Death occurred at 11.25 P.M.

Weigert-Pal preparations from this case reported on by Dr. McCartney show striking areas of perivascular demyelination in cortex, white matter near the basal ganglia, and pons. In the cervical, dorsal, and lumbar regions of the cord this condition is seen here and there.

Dr. E. Weston Hurst has very kindly given his opinion of the histological appearances in these two cases. He considers that in both of them the appearances are within the normal limits for the post-vaccinal type of encephalitis. He adds that, as in all the measles cases which he has seen, the extra-adventitial infiltration is relatively slight in the second case. And further that in Case 1 there is much fragmentation of microglial nuclei, a rather unusual number of polymorphs around some of the vessels, and unusually good preservation of nerve-cells and neuroglial nuclei closely adjacent to the affected vessels.

SUMMARY

Two fatal cases of acute perivascular myelinoclasis, one associated with small-pox and the other with measles, are described. Clinically these cases were of the fulminating encephalic type, and histological examination of the central nervous systems revealed the presence of the changes peculiar to this form of encephalomyelitis. In the small-pox patient nervous symptoms commenced on the eighth day of the focal rash: their onset in the measles patient occurred when the erythema was beginning to fade—i.e., towards the end of the first week of illness as dated from the commencement of catarrhal symptoms. These "incubation" periods are in agreement with recorded experience on this point.

For permission to publish details of these cases I am indebted to Dr. A. F. Cameron.

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DISSECTING ANEURYSM OF THE AORTA

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THE following cases both have atypical features.

CASE 1.—The patient, a man aged 50, first complained of feeling ill on May 2nd, 1934. Whilst he was waiting for a bus he experienced a sudden severe pain in the anterior chest which gripped him like a "vice." The pain continued severe for two to three days. Then he began to complain of pain in the lumbar region of the back. On May 11th he had a third variety of pain situated in the upper abdominal region, below the original chest pain. This was described as being of the same "gripping" type. On the same and succeeding days the stools were dark from contained blood. He was admitted to Dr. E. B. Leech's ward at the Manchester Royal Infirmary on May 12th. He had a systolic blood pressure of 270 mm. Hg, but there were no gross changes in the heart and no murmurs. His arteries (radial and brachial) were extensively degenerated. Temp. 99·2° F.; pulse-rate 104; respirations 18. The patient progressed unfavourably, and on May 13th, after complaining of abdominal pain, lapsed into a semi-comatose state and died.

At post-mortem the heart was found to be much enlarged with hypertrophy of the myocardium. In the aortic arch an atheromatous plaque had ulcerated and permitted the formation of a dissecting aneurysm which extended from the arch down the aorta to the abdominal region. Coronary arteries: atheroma. Stomach: normal. Superior mesenteric artery: completely thrombosed. Small intestine: showed almost complete hæmorrhagic infarction, as did the ascending and transverse parts of the large intestine. There were also present signs of right-sided heart failure. The lungs showed hypostatic congestion.

It appears that at the onset of this patient's illness there was ulceration of an atheromatous plaque with gradual distal dissection of the aneurysm. This, two days later, reached his abdominal aorta—presumably giving rise to the lumbar pain. After nine days the pressure of the outer compartment of the dissecting aneurysm on the superior mesenteric artery at its origin caused thrombosis, with resulting infarction of the intestines. The patient lived 11 days after the onset of his illness. It is unusual to find secondary thrombosis of the superior mesenteric artery. It is suggested that the high systolic blood pressure and the sheath-like action of the dissecting portion were responsible for this in a mechanical fashion.

CASE 2.—Whilst a student at the Manchester Royal Infirmary I was fortunate enough to see a case of dissecting aneurysm of the aorta admitted to the accident room (May 1st, 1931). This patient, a man aged 66, also experienced a sudden onset of pain (the same evening that he was admitted). It had occurred at 8.30 P.M. and had persisted. It was sharp and situated in the middle line of the back between the scapulæ. The patient also had some precordial pain and pain on breathing. He had previously suffered from "Bright's disease" and high blood pressure. A venesection had been performed about 12 months previously. Temp. 96·4° F.; pulse 80–72–64, full and bounding. He was sweating profusely and extremely restless: sitting upright and moving his thorax backwards and forwards. The pain was relieved by morphia gr. ¼ injected intravenously and subsequently intramuscularly. This case was considered to be one of coronary thrombosis. The patient died the next day.

Post mortem the heart showed uniform enlargement and hypertrophy of the myocardium. There was pronounced atheroma throughout the aorta; a plaque 1½ in. above the diaphragm had broken and through this the blood was forced along the thoracic aorta as far as the heart. Mediastinum: infiltrated with blood. Left pleural

sac: extensive hæmorrhage (300 c.cm.). Kidneys: typical arterio-sclerotic lesions. Right adrenal: large adenoma with hæmorrhage into it.

The path of this dissection was retrograde towards the heart. Its origin 1½ in. above the diaphragm and its progress up the thoracic aorta account for the severe pain between the scapulæ. There was a much more rapid termination—possibly due to the infiltration of mediastinum and pleural cavity.

Both cases resembled clinically coronary thrombosis, except for, in the first case a high blood pressure and lumbar pain, and in the second case severe dorsal thoracic pain.

I am indebted to Dr. Leech of the Manchester Royal Infirmary, to Dr. W. Susman of the pathological department, and to Dr. Walker of Stretford, Manchester, for permission to publish these cases.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF PATHOLOGY

A MEETING of this section was held on Oct. 16th, when Dr. PAUL FILDES, F.R.S., gave his presidential address on

Medical Bacterial Chemistry

Dr. Fildes pointed out that the use of the term "medical bacterial chemistry" implied a desire to exploit bacterial chemistry in the service of medicine. Up till recent years biochemists who wished to enter the field of bacterial chemistry naturally selected those bacteria for study whose metabolism could be reduced to simple processes, and these were bacteria of economic but of no medical importance. The metabolism of the medical microbe was too complex to analyse in terms of chemistry. Tentative efforts in this direction failed and were abandoned. More recent advances in biochemical knowledge had, however, reopened interest even in medical bacterial chemistry. Dr. Fildes thought that interest might have been reopened sooner were it not for the absorption of most medical bacteriologists in pure medicine, and the resulting difficulty in arranging satisfactory collaboration between them and biochemists. He proposed to confine his further remarks to the subject of bacterial nutrition, but he indicated that a worker in this field might readily find himself involved in other problems. The nutrients of a pathogenic bacterium were the tissues of the host. Results obtained by test-tube experiments had already been applied to disease (Argyll-Campbell and Fildes). Toxins also were instruments of disease and products of bacterial metabolism. Further, he envisaged the possibility that substances found to be essential for bacterial nutrition might subsequently be found essential for animals. Carotene, for instance, played a part in the metabolism of some bacteria.

A worker studying bacterial nutrition soon found difficulty in the fact that the nutrition of a single species was not constant. Dr. Fildes outlined the materials and mechanisms involved in bacterial nutrition, and stressed the fact that katabolic enzymes were required to break down substrates with the liberation of energy and anabolic enzymes to synthesise bacterial protoplasm with the absorption of energy. The former were non-specific in the sense that energy was the final product, but the latter were specific in the sense that the final product—protoplasm—differed to some extent in all species. It had been shown by Dr. Marjory Stephenson at Cambridge and by others that the enzymes of a bacterium might be changed merely by altering the substrate. They were produced by the bacterium as the result of the stimulus of an abnormal substrate. If an alteration in the katabolic enzymes was induced, the nutrition of the microbe was not affected. Energy was produced as before. But if an alteration was induced in the anabolic enzymes by an alteration in the appropriate substrate, the resulting bacterium was not precisely the same as it was before. The typhoid bacillus could, for instance, be converted into an organism which a bacteriologist would not class as such, merely by altering the substrate in which it lived. In particular, a normal typhoid bacillus must be supplied with tryptophane to grow because it had tryptophane in its proteins and could not synthesise it. But it could be trained to synthesise tryptophane from ammonia—i.e., to produce enzymes in response to the stimulus of ammonia in its substrate which could synthesize tryptophane from ammonia.

If these two types of typhoid bacillus were disseminated at large, the bacteriologist might recover the "new" ones from water, but not the "old" ones, because there is no tryptophane in water. The "old" ones would be recovered only from organic matter containing tryptophane. The distribution in space of these two varieties would be governed by the substrate. Dr. Fildes thought that the development of "ammonia" enzymes was to be looked upon as an atavistic reversion—such strains were older in an evolutionary sense than the tryptophane strains. He proceeded to picture the origin of life in such a cell as the autotrophic bacterium. He argued that the type of life was governed by the type of substrate, and that earth before life was a purely inorganic substrate upon which autotrophic bacteria, but no other known form of life could have lived. These bacteria lived in a similar substrate to this day. The evolution of autotrophic bacteria could have been the first instance of the synthesis of organic matter, and when this took place a new organic substrate would be provided which would induce small alterations in the individuals and so gradually, with substrates of increasing organic complexity, small alterations in the species. Dr. Fildes declined to enlarge upon the implications of this suggestion. Reverting to the account of his typhoid bacillus which was associated in space with tryptophane-containing organic matter, he noted that animals were an important source of tryptophane, and thus this typhoid bacillus would tend to become associated with animals or parasitic. The character of parasitism in a bacterium was associated with a particular order of nutrition in which complex materials were taken preformed from the substrate. Thus when the microbe is in the tissues it must take these complex materials from the tissues, perhaps to the detriment of the cells of the tissues and to the functioning of their anti-mechanisms. The disease produced by a bacterium in the tissues might thus be in part a deficiency disease.

REVIEWS AND NOTICES OF BOOKS

Manometric Methods as Applied to the Measurement of Cell Respiration and Other Processes

By MALCOLM DIXON, M.A., Ph.D., Sc.D., Rockefeller Lecturer in Biochemistry in the University of Cambridge. With a foreword by Sir F. G. HOPKINS, President of the Royal Society. Cambridge: University Press. 1934. Pp. 122. 5s.

FROM the study of the chemical behaviour of the whole animal, and from the description of the chemical reactions which can be performed by isolated and perfused organs, biological chemists have in recent years extended their research to an examination of the chemical life-processes of the cell itself. It is as yet hardly possible to work with individual cells, and it is the average effect of a number of cells which is determined. It is largely by the use of manometric methods that workers have been able to make their determinations with a relatively small number of cells at a time. Manometric methods as applied to tissue metabolism are sufficiently sensitive to enable accurate measurements to be made with a milligramme of yeast or bacteria, or with a few milligrammes of sliced animal tissue. By making it possible to measure the rate at which the cells carry out their chemical reactions these methods also make possible the application of the experimental method. By modifying the metabolism of the cell by artificial means, much is being learnt about the cell's behaviour which would not otherwise be easily discovered. It is only recently that much attention has been paid to the development of sensitive manometric methods, and it must be confessed that the existing apparatus is crude and that the methods, though often ingenious, are not very far developed. Even then the use of the apparatus and of the technique for measurements with surviving tissue demands skill and a considerable amount of experience. It is not to be approached lightly. Dr. Dixon's book, however, makes the approach very much easier; it is the first general account, by an author with considerable experience, of the theory and practice of manometric methods as applied to the study of tissue metabolism. Some of his injunctions may err on the side of over-precaution, but the attention to detail and the original thinking that has gone to the making of this book are remarkable. The theory of the Barcroft manometer is given in full for the first time in the 26 years since this much-used apparatus was designed. A hitherto-unpublished constant-pressure manometer of the author's own design is described. Warburg's rather complicated method of allowing for the CO_2-retention of serum in manometric measurements is presented in easily understandable form.

Dr. Dixon summarises clearly the relative advantages and disadvantages of the possible types of apparatus to be used for a given purpose. His recommendations will be of the greatest help to those who propose to buy manometric apparatus but are puzzled as to which types to choose. When giving the conventional symbols used to denote the magnitude of the metabolism, Dr. Dixon makes the excellent suggestion of $Q\,G^{O_2}$ and QG^{N_2} for aerobic and anaerobic glycolysis respectively, since these, unlike the symbols generally used, are not limited to one language.

Sensitive manometric methods are applicable of course to wider studies than those of cell metabolism. They are being appreciated more and more in pure and applied chemistry. On the other hand, in the study of cell metabolism itself, they will not necessarily remain the best methods. It is difficult to see, for example, how it can ever be possible to record continuously oxygen consumption and acid-production in bicarbonate-containing media by manometric means. Some physical property other than pressure will have to be invoked. But at the moment manometric methods hold the greatest promise in this field, and Dr. Dixon's book is the epitome of their present development.

Le sérum normal

Récolte et caractères physiques. By DENIS BROCQ-ROUSSEU, Membre de l'Académie de Médecine; and GASTON ROUSSEL, Ancien Président de l'Académie Vétérinaire de France. Paris: Masson et Cie. 1934. Pp. 363. Fr.75.

THIS is the first volume of a series of three, the other two being concerned respectively with the physiological and chemical properties of normal serum. Here the authors have discussed with great thoroughness the available information on the various physical constants of serum such as density, osmotic pressure, electrical conductivity, surface tension, viscosity, refractive index, dielectric constant. The book is not one for reading through at a sitting, for few are interested in more than one or two of these details at a time, but as a work of reference it should be of great value.

It may however be questioned whether the scope of the work has not been made too wide for its size. For example the section on pathological variations in serum pH is so brief as to be misleading; moreover it is principally concerned with cancer and diabetes is not mentioned. Similarly, the remarks upon surface tension in malignant disease suggest that the observation made is of real clinical interest which it is not. Valuable chapters are included on the collection and preservation of serum from various different species of animals and upon certain rarely considered properties of serum, such as odour. An excellent bibliography contains 1321 references.

Diathermy in General Practice

Second edition. By ERIC PAYTEN DARK, *M.C.*, M.B., Ch.M. Syd., late Radiographer, Royal Prince Alfred Hospital, Sydney; Demonstrator of Anatomy, University of Sydney. With a chapter on Diathermy in Gynæcology, with special reference to Major Surgery, by F. A. MAGUIRE, C.M.G., D.S.O., M.D., Ch.M. Syd., F.R.C.S. Eng., F.R.A.C.S., Hon. Gynæcologist, St. Vincent's Hospital, Sydney. Also a chapter on Diathermy in the Treatment of Mental Disorders, by GUY U. P. PRIOR, L.R.C.P. Lond., M.R.C.S. Eng., Superintendent, Mental Hospital, Paramatta, N.S.W. Sydney: Angus and Robertson Ltd. 1934. Pp. 219. 17s. 6d.

AFTER giving a brief account of the history of diathermy, the principles on which it is produced, the methods of administering it by way of electrodes in contact with the skin, and its physiological properties, Dr. Dark has written on the therapeutic effects of diathermy in fibrositis, injuries, neuritis, rheumatic and inflammatory conditions, and high

blood pressure. Notes are given of 83 cases. In a chapter on pneumonia he describes the methods and results of Dr. H. E. Stewart of New Haven, U.S.A. In regard to the treatment of gonococcal infection he himself has had little experience, but he has written an account of the work of the original investigators in London, Chicago, and Colorado Springs. A short outline of surgical diathermy is given, and the chapter dealing with the surgical treatment of the chronically infected tonsil by this means is of special interest; Dr. Dark has practised this form of treatment for six years without being a blind adherent to it, and he states its limitations and disadvantages as well as those of treatment by enucleation. The future of diathermy is viewed in the concluding chapter.

The book provides a good picture of the therapeutic field of diathermy, chiefly in its non-surgical aspects. Dr. Dark writes largely from his own experience in the treatment of common complaints in ambulatory patients, and the information which he gives will be helpful to practitioners, especially those working in the "one-man towns" of Australia or in districts where the service of trained auxiliaries is not obtainable. A series of plates show the positions of the electrodes during treatment of the joints and the chest. The style of writing is attractive and colloquial.

Mr. Maguire describes some strikingly good results which he obtained by using surgical diathermy in the treatment of malignant disease of the urethra, vagina, and cervix; but apart from the very brief account of the treatment of cervicitis there is nothing on the non-surgical uses of diathermy in gynæcology. Dr. Prior's account of results of treatment of 24 cases of general paralysis of the insane is brief and concise. He employs the method of Neymann and Osborne. He has treated 21 cases of other forms of mental disease, either by the same method or by cerebral diathermy. The treatment was apparently given for the purpose of investigation, and Dr. Prior remarks that the results "if not universally good, are of such a nature as to render this treatment well worth further study." The book will be a useful addition to the library of those who are interested in physical medicine. It is clearly printed in large type and it is very light for its size.

Diseases of the Skin

A Handbook of Dermatology for Practitioners and Students. By S. ERNEST DORE, M.A., M.D. Camb., F.R.C.P. Lond., Consulting Physician, St. Thomas's and Westminster Hospitals; and JOHN L. FRANKLIN, M.A., M.D. Camb., M.R.C.P. Lond., Assistant Physician Diseases of the Skin, Westminster Hospital. London: Cassell and Co., Ltd. 1934. Pp. 410 and 46 half-tone plates. 10*s.* 6*d.*

THE modern student of dermatology is more fortunate in some respects than his predecessors, for although the scope of the subject has been broadened, nomenclature has been simplified and ætiology accorded an increasingly important and scientific position in the nosology. The clinical knowledge set out in the older text-books, however, cannot safely be disregarded, and Dr. Dore and Dr. Franklin have done well to rescue from threatened oblivion a text-book which in its day passed through seven editions, and to bring it up to date.

The work has been well done, and would have earned the commendation of its illustrious progenitor, the late Sir Malcolm Morris. The table of contents has been radically revised. It is to be regretted that there is no standard and accepted method of classification in dermatology. Some adhere to the older method based on morphology of the lesions, others attempt to classify according to the ætiology, so far as this is known, and others again prefer a mixed table, so that unless the reader has considerable knowledge of the subject he will be liable to confusion at the very outset. Why, for instance, in this book should a chapter on the neurodermatoses and prurigo follow immediately on Chapters 1 and 2 which deal with the anatomy, physiology, and principles of diagnosis? Another author follows his introductory chapters with sections dealing with parasitic diseases, and a third with the congenital affections of the skin. The last arrangement is that which was followed by most of the classical writers from Hebra onwards, and in the present state of our knowledge would appear to be the most rational.

The authors say that so much fresh matter had to be introduced that the book had become virtually a new one. Much of the original text, however, seems to have been preserved in this volume; it is a comment on our present lack of knowledge to note how little alteration was needed in the excellent chapter on leprosy. The illustrations are not quite up to the modern standard, but are fully typical of the diseases they portray.

La tuberculose pulmonaire

Et les maladies de l'appareil respiratoire de l'enfant et de l'adolescent. By P.-F. ARMAND-DELILLE and CH. LESTOCQUOY. With the collaboration of R. HUGUENIN. Introduction by Prof. CALMETTE. Paris: Amédée Legrand. 1934. Pp. 512. With 541 figures. Fr.350.

THIS sumptuous volume is a pictorial record of pulmonary tuberculosis and respiratory disease as it affects the infant and the adolescent. The method of investigation has been threefold, radiological, bacteriological, and anatomical. The authors point out that in order to establish completely the diagnosis of a chest disease four conditions must be satisfied: (1) a study of the ætiological factors, especially with regard to the possibility of family infection; (2) what they describe as the biological reaction—viz., the cutaneous reaction of Pirquet or the intradermal reaction of Mantoux; (3) the radiogram and its accessory, the radioscopic examination; and (4) the search for Koch's bacillus, in which connexion great emphasis is laid on the method of gastric lavage.

This, in brief, is the method of approach. The details are worked out in an elaborate series of very beautiful radiograms, often with lipiodol pictures to bring out important details. These radiograms are in many cases controlled by photographs of the lung specimen as removed at autopsy, together with line drawings (many of them coloured) to indicate special points and microphotographs of histological sections. Some of the radiograms are of full size and exemplify practically every type of tuberculosis. There are in all no less than 541 figures, of which 164 are radiograms, 233 diagrams and line drawings in black or in colour, and 144 histological sections. In view of this generosity on the part of the publishers the price appears to be extremely reasonable. The collection and representation of typical specimens must have involved a vast amount of labour and their technical reproduction leaves nothing to be desired. We know of no comparable work of this scope. It has no complete bibliography but a few references in footnotes and a satisfactory index.

Handbuch der Chemotherapie

Vol. II. By Dr. VIKTOR FISCHL, Auswärtiger Wissenschaftlicher Mitarbeiter der Schering-Kahlbaum A.G., Berlin; and Prof. Dr. HANS SCHLOSSBERGER, Mitglied des Reichsgesundheitsamtes, Berlin-Dahlem. Leipzig: Fischers Medizinische Buchhandlung. 1934. Pp. 359–898. M.55.

As a catalogue of organic therapeutic compounds this handbook is supreme, and it is enough to add that the work is done with the accuracy and precision which we are in the habit of associating with the best German publications. The second volume, like the first, will take its place in the library of any department of experimental pharmacology or chemotherapy.

MEDICINE AND THE LAW

Proof of Age

How does a man know his own age? Will a court of law accept his own statement on the point? The answer to these questions would appear simple, but the law has a habit of insisting on the best possible evidence and of rejecting anything like hearsay. At Westminster county court last week two young women, sued for a debt of £19, pleaded infancy and produced their birth certificates to show that they were under age at the time of the transaction. The plaintiff's counsel objected that a person cannot give evidence of his or her own age. The father of one of the defendants was then called into the box and stated the age of his daughter. "I don't suppose," said cross-examining counsel, "that you were present in the particular place where your daughter was born?" "No," replied the witness, "but I was in an adjacent room and information of the birth of a daughter was given to me." He identified the baby as the defendant in the case. The judge thought the evidence sufficient but was willing, if required, to have the defendants' mothers brought to court at the plaintiff's expense to supplement and confirm it. In the judge's view any individual is a competent witness as to his own age, and more particularly when he backs his evidence with a birth certificate. The point being novel, he was willing to grant leave to appeal if application was lodged in 21 days.

The text-books usually explain that a birth certificate is not evidence unless the entry purports to have been signed by a person professing and qualified to be the informant or unless it was signed in the special conditions for registering births at sea. A certificate, though in all other respects regular, is useless in evidence unless identified with the particular person whose birth it records. In the Westminster case last week the ordinary layman would have little doubt that identification was complete.

Claims against Deceased Doctors' Estates

Under the title of "A Mare's Nest" the *Law Journal* recently referred to a paragraph in a London evening newspaper headed "Doctors' Danger." If the latter caused any practitioner's heart to beat the faster, our learned contemporary's comments will perhaps provide a sedative. According to the newspaper paragraph the medical profession was alarmed at the new danger to which doctors were to be exposed by the operation of the Law Reform (Miscellaneous Provisions) Act in the present month of October. This mention of a date was somewhat puzzling at the outset because the Act came into effect last July; the risk has consequently been running for two months already, though possibly regarded as dormant during the lawyers' long vacation. The substantial cause for alarm, it seems, was that doctors would in future be attacked on a much wider front by plaintiffs seeking damages for professional negligence where the doctor's patient has died. Then came a remarkable instance. "A hypothetical case quoted to me by a legal authority to-day," said the paragraph, "showed how a disappointed legatee might attempt to get the value of a missing legacy from the pocket of the testator's doctor." This instance was based on the threefold assumption that the patient bequeathed to the hypothetical plaintiff a legacy, that the patient died from his doctor's negligence, and that, if the patient had only been kept alive, the estate would certainly have become solvent. How this last condition could have been proved by the plaintiff, and how he could overcome the legal difficulties arising from the remoteness of the supposed damages, the paragraph did not explain. In fact, as the *Law Journal* hinted, this attempt to create alarm and despondency in the ranks of medical practitioners was perhaps the work of a not very seriously minded person.

The main object of the Act, set forth in its first section, was to get round the curious maxim of the English law, actio personalis moritur cum persona—a personal action dies with the person. A simple example was given by the Law Revision Committee which reported to the Lord Chancellor last March. If a negligent driver of a vehicle was killed in any collision caused by his negligence, the rights which persons seriously injured would have had against the negligent driver, if he had not been killed, were extinguished by his death. It followed that the liability of the insurance company under the third-party-risks policy came to an end, and neither the sufferers, if alive, nor their dependants, if the victims were dead, could have any redress. The committee was impressed by the injustice of this position; it regarded a remedy as the more urgently needed because the number of traffic casualties has so greatly increased. The new Act gives the remedy, and inevitably a claim against the estate of a negligent surgeon who has died becomes possible in the same manner as a claim against the estate of a negligent motorist who has died. The medical profession could hardly have succeeded in obtaining for itself a statutory exception for its own species of professional negligence. The new law has, for reasons of legal history and doctrine, complications too technical for a brief summary to expound. It is not confined to giving a remedy where the potential defendant has died; it also improves the position of the dependants where the potential plaintiff has died, though it contains provisions intended to keep down the amount of the damages to be awarded. Without going further into the details of the statute, we may here note that, in the case of rights of action which will in future survive against the estate of a deceased person whose negligence is the basis of the plaintiff's claim, the claim will not be entertained unless (*a*) the legal action had already been begun before his death, or (*b*) the cause of action arose not earlier than six months before his death and the proceedings are begun not later than six months after his personal representative took out representation. This period of limitation, so far as it goes, will do something to restrict the liability of practitioners who are naturally at a disadvantage when acts or omissions in the course of a busy professional life are challenged long after the case is forgotten.

THE LANCET

LONDON: SATURDAY, OCTOBER 20, 1934

WHOOPING-COUGH: THE PROMISE OF RECENT WORK

IT was characteristic of much of the earlier work on vaccines in whooping-cough that where one observer had at least moderate success another had little or none. Although there was relatively greater agreement about their prophylactic value, vaccines in treatment seemed no more reliable than the hundred and one drugs which from time to time have been recommended as specific. Indeed it has been questioned whether the *Bacillus pertussis* of BORDET and GENGOU is, after all, the causal organism of the disease; may it not be merely concomitant, a filtrable virus being really accountable? The belief that the Bordet-Gengou bacillus is the true and sole cause has received incontestable support, however, from a critical human experiment.[1] From the work of the MACDONALDS it is concluded that the disease is caused by the Bordet-Gengou bacillus exclusively, and that active immunisation is produced by vaccines prepared from it. The cough-plate method referred to (which was fully described by A. D. GARDNER and P. H. LESLIE in our first issue for 1932) consists in the exposure and subsequent incubation of a defibrinated, preferably human, blood-agar plate a few inches from the child's mouth when it is in the act of coughing. Its reliability has been favourably reported upon by many workers. P. KENDRICK and G. ELDERLING[2] were able by its use to recover the *B. pertussis* in from 78 to 84 per cent. of 207 clinically diagnosed cases in the first three weeks of the disease, the percentage falling to 39 in the fourth week and to zero in the sixth week. Since in its early stages the disease is not only most infective but most difficult (if not impossible) to diagnose on clinical grounds, the importance of this method is obvious. Clearly, too, it would be of great assistance in control of the disease if a test of susceptibility, analogous to the Schick test, were available. With this in mind S. K. SIEBLER and S. OKRENT[3] injected intradermally 1 to 2 minims of a suspension of fresh organisms in physiological saline with 0·5 per cent. phenol, using the phenol saline alone as a control. Production of an area of redness, 1 cm. wide or more, best observed at 72 hours, was regarded as evidence of susceptibility. Positive tests in the acute phase of an attack became negative in the fifth week after onset, and after vaccine prophylaxis 20 out of 25 children gave negative tests four months later. The latter result incidentally supports SAUER'S opinion[4] that three or four months should be allowed to elapse between inoculation and exposure in order that immunity may have time to develop.

Whooping-cough is the most serious of the acute specific infections of childhood, not excepting measles, and it is important that this work should be repeated upon a larger scale. Great care is now taken in preparing pertussis vaccines to ensure that the organism is actually *B. pertussis* unmixed with other strains of the same hæmophilic group, that fresh cultures in the correct antigenic phase are used, and that the dosage is adequate. Some vaccines contain organisms with their endotoxin intact; others are detoxicated. K. KUNDRADITZ,[5] in a contribution the more valuable because of its caution, recounts his experiences with a vaccine prepared by the Vienna Institute of Serotherapy. Five injections were made at intervals of one to two days; the first three consisted of 3, 4, and 6, and the fourth and fifth of 8 thousand million organisms. Reactions, often troublesome with the older vaccines, were confined to slight local redness or occasionally transient pyrexia. In one group 16 children of different families were exposed to definite infection at home. Contact was intimate and prolonged; no isolation of the declared cases was attempted. Amongst the exposed children were some who when inoculated had no cough at all; in others the cough was very slight and not characteristic. Inoculations might thus be regarded either as prophylactic or as attempts at early therapy. None of the 16 children developed typical whooping-cough; four remained entirely free; eight developed slight atypical coughs, whilst the remaining four had for one or two weeks sporadic attacks sufficiently typical to make a diagnosis just possible. In another group of children with definite whooping-cough inoculation produced notable amelioration in 14 out of 18 who were in the early paroxysmal stage? KUNDRADITZ observes that in the early stages it is only the activities of the *B. pertussis* which have to be checked by specific therapy, whereas later, secondary infections and possibly gross pathological changes come into play. J. M. FRAWLEY[6] points out that bacterial antigens are altered by physical

[1] H. and E. J. MACDONALD (Jour. Infect. Dis., 1933, liii., 328) obtained the services of four healthy boys. None had previously had whooping-cough but two had been inoculated with vaccines prepared by the method advocated by L. SAUER. All four were segregated together. Into the nose and throat of each was first instilled a culture filtrate prepared from the *B. pertussis*. Observations over a sufficient period to allow of possible incubation were quite negative. Next was instilled, similarly, a suspension prepared from a second generation of the same organisms. The two inoculated volunteers remained free from symptoms during the entire period of observation; cough plates (vide infra) were repeatedly negative. On the other hand, the two boys who had not been inoculated both developed typical severe attacks of whooping-cough. Cough plates were strongly positive in the catarrhal and pre-paroxysmal stages, but became and remained negative when the typical paroxysmal stage began. Confirmatory findings were a high leucocytosis and positive complement-fixation tests.

[2] Amer. Jour. Pub. Health, 1934, xxiv., 309.

[3] Jour. of Pediat., 1934, iv., 183.

[4] Jour. Amer. Med. Assoc., 1933, ci., 1449.

[5] Med. Klin., August 10th, 1934, p. 1060.

[6] Jour. Amer. Med. Assoc., Sept. 29th, 1934, p. 960.

agents such as heat or chemicals and thus lose their relationship in whole or in part to the organism from which they originated. Accordingly for the past two years he has made prophylactic injections of a vaccine prepared by disrupting mechanically living virulent phase I. organisms, which were described by GARDNER and LESLIE as the strain of high antigenic activity. After disruption, the resultant suspension is subjected to filtration through collodion membranes. All intact cells are retained; material in molecular or colloidal solution passes through and this filtrate contains the antigen. FRAWLEY claims that no reaction follows its use because the bulk of bacterial protein has been removed and the toxic filtrate has been eliminated by thorough washing. Further, since human and not animal blood is used to enrich the medium there is no danger of sensitisation by adsorbed foreign protein. Preliminary trials of small doses were encouraging; larger doses have produced better results. Thus 505 non-immune school-children received once weekly four injections of 2 c.cm. of the antigen. Subsequently 80 were intimately exposed to whooping-cough. In 49 no symptoms developed; 31 did develop very mild attacks. The controls were 174 unselected uninoculated children with whooping-cough seen during the same period. Whereas in the inoculated group in only one child of the 31 did the paroxysmal stage last two weeks or more, amongst the controls there were 116 such attacks. No reactions followed the injection of non-immunes; on the other hand, considerable reactions, probably allergic, resulted from the injection of recently recovered children. FRAWLEY suggests that the routine inoculation of kindergarten children would remove the dangers of epidemics because such children are often allowed to attend school during the highly infectious catarrhal stage.

It is clear that recent work abroad on the specific control of whooping-cough shows great promise. It is true that it owes much to English workers such as GARDNER and LESLIE and, given the chance, English workers are ready and willing to repeat and extend it. But how is it possible for immunologists in this country to assess at first hand new advances in the control of this or any other infection unless opportunities are provided freely and fully in the interests of the public health?

NATIONAL RADIUM

DESPITE the threat of the Curie-Joliots and the Fermis to produce radio-activity out of the common elements, the Radium Trust continues unperturbed to safeguard the national supply of radium and the Radium Commission to apply this radium to medical needs.[1] The total amount of radium now placed at the disposal of the Commission by the Trust is about 20 grammes, and its sterling value remains unchanged. Although so large it is only a fraction of the total quantity of radium available for treatment in the country which is now about 70 grammes. Custody of this precious element is a great responsibility. During the past year the Commission has paid out £550 in insurance, claims, and repair charges; precautions are however proving more and more effective and only two containers with about 7 mg. of radium were lost, the cost being covered by the underwriters. Only a small amount of element, about 175 mg. in all, has been purchased during the year, mainly to honour the undertaking to supply the immediate needs of the centres, many of which required new containers owing to changes and improvements in technique. All this radium is of Belgian origin, except a small quantity of Cornish origin lent by the Trust to the National Physical Laboratory for an investigation into the possibility of measuring gamma-ray dosage in terms of the rontgen (r).

The policy of the Commission in the disposal of this radium was defined four years ago and is being maintained. In order to avoid wastage of radium-time and ensure efficient use of staff and service, the Commission laid down the principle that patients should be brought for treatment to centres which possessed fully equipped clinics and specialist staff rather than that the radium should be taken to the patients. There are now 13 national radium centres scattered at convenient spots over England, Wales and Scotland with a view of serving the whole country, but owing to their geographical distribution it was found necessary to relax to the extent of setting up five regional centres at outlying spots—viz., Lincoln, Norwich, Plymouth, Southampton, Stoke-on-Trent. So satisfied has the Commission become of the wisdom of this concentration that during the past year it has withdrawn its supplies of radium from three of the centres where the conditions were not being observed. At one of these the Commission was unable to find the spirit of coöperation and progress exhibited by the majority of centres; at another the building allotted for a radium institute had not been adapted for its purpose, nor had the promised radon installation come to fruition; at a third no full-time officer had been appointed. In regard to these matters the report is as frank as anyone could desire. At other centres the coöperation and concentration are commended and a word of recognition is given to one at the appointment of the radium officer as research lecturer so that he comes into contact with students in their final year; to another at the fact that the radon laboratory is functioning exactly in the manner outlined by the Commission; to another that the follow-up work is so complete that practically all patients have been traced; to another at the experience with a small mass unit which justifies the allocation of a larger unit of one gramme. Taking the centres as a whole however, the Commission is still anxious that there are so few signs of expanding bed accommodation. It is essential for the success of the scheme that each centre should provide for the needs of a population larger—it may be much larger—than that normally served by the hospitals in

[1] Fifth Annual Report of the National Radium Trust and Radium Commission, 1933–34. H.M. Stationery Office. Cmd. 4711. 9d.

which they have been established. Provision of more beds is a crying need at this stage. In several centres the tendency to combine treatment by X rays with that by radium is acting as a further incentive to concentration. One centre is in the process of installing a deep X ray therapy plant which will be capable of running six tubes simultaneously, and at other centres deep X ray treatment is now available or will be shortly. At another centre a new type of X ray tube has been installed of such a design that should the filament burn out the tube can be dismounted, a new filament introduced, and the tube put into action in a few hours. This initiative is highly commended.

Although at the moment the amount of radium is regarded as sufficient, the Commission foresees that an increased demand may arise in two ways. In the first place there is a growing recognition that for cancer in many sites radium treatment is the treatment of choice, if only as a palliative; and in the second place there is an increasing demand for quantities of radium large enough for use outside the body, several inches away from the skin. There are now three units of one gramme each allotted by King Edward's Fund to the Cancer, Middlesex, and University College Hospitals; all these units have been in continuous use since August, 1932, and during the year 1933–34 a total of 251 cases were so treated under identical conditions as regards filtration, skin distance, shape and size of beam, so that the results can be compared. There is in fact an interim report in prospect this year in which the investigators will attempt to differentiate methods on a broad basis, and with the help of comparable data obtained by surgical methods. These one-gramme units are quite independent of the research on beam therapy which is being carried out at the Radium Institute under the joint supervision of the Medical Research Council and the Department of Scientific and Industrial Research. The Radium Trust is watching with interest the results of this research to see what bearing it will have on the provision of radium treatment on a national scale.

INFLUENZA VIRUS: A FURTHER ADVANCE

LITTLE more than a year ago a great advance was made in our knowledge of the causation of influenza, as the outcome of the work of SMITH, ANDREWES, and LAIDLAW.[1] They found that influenza could be transmitted to the ferret and, profiting by this discovery, demonstrated conclusively that the prime cause of this disease belonged to the group of filtrable viruses. We are now indebted to the same group of workers for a further advance in this field of research. In a communication by ANDREWES, LAIDLAW, and WILSON SMITH, which appears on another page of this issue, evidence is produced to show that, suitably inoculated, the mouse can be infected with the virus of influenza. Their first experiments were made with a strain of Shope's swine influenza virus which, it will be recalled, they had previously found to be either identical with or a very close relative of the human virus. Using a strain of virus which had been passed 42 times through ferrets, six mice were inoculated directly into the lungs through the chest wall. The mice remained to all appearances well, but when they were killed five days later one was found to have developed an area of consolidation in the right lung. A suspension of this organ administered intranasally to a ferret produced typical ferret influenza, and when it was injected into the lung in six more mice resulted again in one mouse developing an area of pneumonic consolidation. In subsequent passages mice were inoculated intranasally, under light ether anæsthesia. This was found to be a superior method to that of direct inoculation into the lung, a higher proportion of mice being infected; in this manner the virus was passed serially through mice 16 times without difficulty. It is noteworthy that the swine influenza infection in mice is like that in the ferret and unlike that in the pig; the virus alone produces a severe and perhaps fatal disease, no concomitant bacteria being necessary.

On repeating these experiments with a ferret strain of human influenza virus much the same results were obtained and 11 serial passages were achieved. Most of the mice were killed about the fourth or fifth day for the purpose of passage, but these strains of virus adapted to the mouse produced definite signs of illness and if the infection was allowed to take its course it commonly had a fatal termination. Since methods of rigid quarantine were not employed in these experiments, the observers considered the possibility that the mice inoculated with the human strain of influenza virus might unwittingly have been infected with the swine influenza strain, and that only this latter virus might be capable of infecting mice. The venue of the experiments was therefore changed from the farm laboratories of the National Institute for Medical Research at Mill Hill to their laboratories at Hampstead and, using another ferret strain of human virus, the work was repeated. Similar results were obtained clearly indicating that the mouse is susceptible to both swine and human influenza virus administered by the respiratory route. When it is added that cultural and filtration experiments left no doubt that the disease in the mouse was due to a filtrable virus, and that hyper-immune sera prepared against the ferret strains of human and swine influenza virus neutralised the corresponding mouse strains, it will be seen that the story is complete. It is true that there is detail to fill in, but the outline is drawn with unfaltering strokes.

The importance of these findings needs no emphasis. To have available for influenza work an inexpensive and easily handled animal like the mouse is an enormous advantage. It has yet to be shown that the mouse can be infected direct from man, but ANDREWES, LAIDLAW, and WILSON SMITH do not think this

[1] THE LANCET, 1933, ii., 66.

should prove impossible, provided that the inoculum is given by the respiratory route and a sufficient number of animals are used. Should this be achieved the study of the virus of influenza will have been brought within the scope of even the most modestly equipped laboratory, and investigation of influenza will have been given an immense fillip. Meanwhile it is noteworthy that both viruses were neutralised by specific antisera, the serum used for the human (W.S.) virus being from a horse hyper-immunised with tissue from ferrets infected with the same strain. Five mice receiving mixtures of virus and undiluted serum survived, though they were afterwards proved to be susceptible, while five controls all died with typical lesions six or seven days after infection.

ENCEPHALITIS IN ST. LOUIS

A YEAR has now passed since encephalitis swept over the city and county of St. Louis, Missouri, with an incidence of about 1 in 1000 of the population and a case-fatality rate of 20 per cent. While much has been written about this epidemic in the American medical press (quotations from which have from time to time appeared in our columns [1]) no comprehensive account of it can be written until the pathological investigations are completed and the after-histories of the sufferers recorded. A preliminary survey, however, may now be made, and at the annual session of the American Medical Association held at Cleveland last June eight papers were given each dealing with a particular aspect of the subject.[2] In summarising the views expressed one can see how far they provide answers to the wide question which naturally arises first—Can this outbreak be definitely placed in the same class as any of the known previous epidemics of encephalitis? If so, which?

Dr. JOSEPHINE B. NEAL in a general review gives the following groups as a tentative classification of the various known forms of acute encephalitis: (1) (*a*) epidemic (lethargic) encephalitis, (*b*) acute encephalomyelitis; (2) Australian X disease; (3) Japanese type B; (4) encephalitis following vaccination; (5) encephalitis following infections; and (6) the St. Louis epidemic. The pathological investigations make it clear that etiologically this last differs from all the others; for a virus has been obtained pathogenic for mice, and somewhat for rhesus monkeys, which is distinct from those previously known. The experiments from which these important findings are obtained were carried out simultaneously at two separate laboratories. The grounds upon which the conclusion that this virus is the causal agent of the St. Louis epidemic is based are the number of strains of similar characteristics isolated, and the neutralisation of the virus by serum of individuals convalescent from encephalitis in this epidemic, but not by the serum of individuals recovered from other diseases. In mice, after intracerebral inoculation of brain tissue from dead patients, the incubation period was usually about five days; in monkeys, which are less susceptible, it was eight to fourteen days.[3] Mice usually die if definite signs of illness develop; monkeys, on the other hand, may recover. The virus can be transmitted in mice by intracranial inoculation, in a dilution of 1 in 1,000,000 of the mouse brain; by the intranasal route a somewhat larger dose is necessary. Histologically the changes found in the nervous system of the animals are consistent with those observed in the human disease. On the clinical side, it was pointed out from the first that in the St. Louis epidemic the focal stigmata so common in lethargic encephalitis were uncommon; extreme lethargy and acute delirium were unusual; diplopia was very rare. On the whole the type of disease resembled the Japanese type B rather than Economo's disease. In view, however, of the wide variations in the clinical features of successive annual outbreaks of the latter, too much stress must not be laid on these differences. More important is the apparently high incidence of meningeal symptoms, in which connexion lumbar puncture yielded valuable information. The cerebro-spinal fluid was clear under moderately increased pressure; cell counts from 50 to 250 or even exceptionally 500, chiefly mononuclear, were found; neck stiffness and Kernig's sign were common. In age-incidence and case-fatality, too, this epidemic was unlike Economo's disease. In St. Louis both incidence and fatality were strikingly increased with age—a finding in strong contrast to the heavy incidence of Economo's disease on children and young people, and its comparative rarity after middle life. Again, on the morbid anatomical changes found in the nervous system of the St. Louis cases differences from Economo's disease were observed, in that the meninges showed more intense infiltration with mononuclear cells; degenerative changes in the nerve-cells were commoner and neuronophagia was conspicuous. Also the inflammatory foci were more widely spread; the cranial nerve nuclei rarely showed degenerative changes and the cord was more extensively involved. Although in mild cases the differences found are not sufficient to make a differential diagnosis from Economo's disease certain, the more severe can readily be so distinguished and closely resemble the pathologic picture of Japanese type B.

It thus seems that the answer to our question, so far as it can yet be answered, is that the St. Louis epidemic is not the same as Economo's disease; it approaches most nearly to the Japanese type B. There is, however, one important piece of information which this preliminary survey cannot give and it must be given before the answer can be called complete. What are the after-effects of the St. Louis epidemic? Time alone can show. In one of the papers it is said that after the acute stage some of the more severe cases developed Parkinson's syndrome in mild degree; otherwise little information is as yet forthcoming. Had

[1] THE LANCET, 1933, ii., 670, 811, and 931.
[2] Jour. Amer. Med. Assoc., Sept. 8th and 15th, 1934.

[3] The opportunities for computing the incubation period in man were few, but certain observations were made and in seven cases this was estimated at from four to fourteen days.

a similar survey been made in Europe nine months after the first outbreak of Economo's disease in 1918 possibly the information under this heading would have been comparable. A little later and how different! There is a hopeful feature about the St. Louis outbreak. The after-effects of the Japanese type B epidemic were less numerous and serious than those of lethargic encephalitis, and it may be hoped that the St. Louis infection may resemble Japanese type B in this respect also.

No account of this epidemic would be complete without a warm tribute to the team-work which must have played an appreciable part in its control. In one of the papers BREDECK and ZENTAY describe it under the title of Handling of the St. Louis Epidemic of Encephalitis, and their description shows not only the admirable rapidity with which the various medical units—often widely separate in location and organisation—were brought at once into active coöperation to meet the emergency, but also the way in which civic and State authorities belonging to distinct and independent corporations were got into combination without waste of valuable time. The result is one on which all concerned must be congratulated, and it may well be considered an object-lesson to the European nations.

ANNOTATIONS

THE HARVEIAN ORATION

ON Thursday last, St. Luke's day, the Harveian Orator, Dr. James Collier, whose oration is substantially reported elsewhere, commenced with a brief but eloquent summary of Harvey's services to science in general and the Royal College of Physicians of London in particular. He dwelt on the great physician's pleasure in research and equal pleasure in the promotion of good fellowship, and connected the harmonious atmosphere of the College with the influence of Harvey's benefaction, which received its annual festal celebration for the 278th time the same evening. In his own country Harvey was more fortunate than many great pioneers and inventors have been; he conquered dissentients by their surrenders. But abroad his discovery met with opposition for a time and though his opponents more than once became his advocates later, there are still those who do not see that Harvey was the first to solve the problems. Harvey was, as Dr. Collier said, from the manner of his work in experiment and in observation of proofs, the inventor of medical research as understood to-day. The law which he laid down of "Omne vivum ex ovo" is the starting-point in the idea of evolution. In the flight of thought, expressed in his words "Epidemic, contagious, and pestilential diseases scatter their seeds and are propagated to a distance through the air and in hidden fashion silently multiply themselves by a kind of generation" he was the prophet of bacteriology to come. The opponents of Harvey as the veritable discoverer of the circulation of the blood are wont to quote sentences and expressions from bygone writers, ranging back to the most distant classical times, which can be taken to foreshadow the fact that the blood goes round the body. Many examples can be found in association with other fundamental discoveries where somebody has said something which can be regarded as prophetic, but this kind of adumbration has no value for science. Harvey was not content with a few expressions of brilliant intuition. As his great idea became clearer to him he persisted in experiment and investigation with a result that has been aptly described by Sir Arthur Keith as a perfect piece of detective work—he assembled his facts, tested them, collated them, and from them made the perfect deduction. There is no comparison to be fairly instituted between the promulgator of the happy idea, or even him who follows up his idea with zeal and arrives at approximations, and the patient conscientious investigator, who furnishes the complete answer to the problem; and such was Harvey.

In Dr. Collier's delightful oration we have picturesque notes on the circumstances surrounding many fundamental medical discoveries and on the personalities of the pioneers.

THE PRINCIPLES OF RESUSCITATION

WE have become familiar of late years with the use of carbon dioxide as a respiratory stimulant; but according to Prof. Yandell Henderson[1] it is more than this, and in some kinds of asphyxia its restoration to the body may be almost as important as that of oxygen. In the course of two papers he details three different physiological types of asphyxia and the most suitable treatment for them; he then takes well-known clinical asphyxial conditions and describes individually their characteristics and treatment. These papers are really a practical monograph on resuscitation, and they should be in the hands of everyone whose work brings him into contact with cases where it is necessary. The subject matter is already condensed, and only one or two of the conclusions can be mentioned.

In the most acute form of asphyxia, well exemplified by drowning, the cardinal feature is failure of the respiratory mechanism, and, once this is restored to normal, recovery is usually uncomplicated. For such cases all other treatment fades into insignificance beside the urgency of artificial respiration. Carbon-monoxide poisoning represents a subacute form of asphyxia in which the mechanism of respiration itself is not dislocated, so that artificial respiration is not necessarily of primary importance; the victim is often breathing spontaneously. He is, however, suffering from lack of oxygen, and the degree of deprivation commonly experienced, acting over a relatively long period, may be sufficient to do permanent damage to the tissues. The most pressing requirement here is a rapid restoration of the normal conditions, and the most obvious remedy is the administration of oxygen. This acts too slowly. During the poisoning, in an attempt to get an adequate supply of oxygen, the patient has overbreathed and washed large quantities of carbon dioxide out of his system, and this apparently has more profound effects than the mere removal of the normal stimulus to respiration. The alkali reserve is diminished, and a state of acidosis supervenes, the remedy for which, paradoxically, is the administration of carbon dioxide. This cuts across biochemical theories, and indeed, an animal, in which acidosis has been induced by the actual injection of acid, rapidly succumbs to carbon

[1] Jour. Amer. Med. Assoc., Sept. 8th, 1934, p. 750; and Sept. 15th, p. 834.

dioxide. To distinguish the asphyxial type of acidosis, Prof. Henderson has introduced the term "acarbia"; he is unable at present to give it a theoretical background but insists that the foundation for this must be the fact that it is cured by carbon dioxide inhalation. The third type of asphyxia is chronic, and characterised by shortness of breath and continual oxygen-debt, and occurs in heart disease and anæmia. The indications are, of course, for oxygen and additional red blood corpuscles.

Prof. Henderson steadily emphasises the value of carbon dioxide in its dual rôle, and he says that where the sensitiveness of the respiratory centre has been blunted, mixtures containing 20–30 per cent. may bring about dramatic recovery. The applications of these principles of resuscitation to individual cases are well worth the study of specialists; the sections on asphyxia neonatorum and anæsthetic depression are particularly interesting. The author discusses the suitability of various mechanical devices and points out dangers associated with some of those on the market.

THE LONDON AND COUNTIES M.P.S. AND "1921 DENTISTS"

THE resolution recently passed by the Council of the London and Counties Medical Protection Society which makes dentists admitted to registration by the 1921 Act eligible for membership under certain conditions marks a change in the policy of the Society which is likely to have interesting developments. The division between dentists possessing a qualification by examination and those admitted to registration by the Act is breaking down. The standards of ethical practice enforced by the Dental Board have done much to weed out those to whom the Act had clearly given an undeserved status, while panel dentistry has been a useful factor in bringing the two sections of the profession closer together, and in the Public Dental Service Association all registered dentists meet on a common basis of membership. There seems good reason therefore to allow 1921 dentists to share the advantages of professional protection offered by a society with such an exceptional knowledge of the problems of medicine and dentistry as the London and Counties. An increasing number of qualified dentists are becoming associated with 1921 dentists in practice and the difficulties which have arisen in the past because the Society could not accept the latter as members will now be obviated. The clause, which insists on a recommendation by two members of the Society, one of whom must be a dental member, is a reasonable one, for it is obviously necessary for the Society to insist on both professional competency and due ethical standards.

HOSPITAL SUPPLIES: AN EXTENDED SCHEME

WHEN the Central War Hospital Supply Depôt closed down after the war, its work was continued in aid of civil hospitals by the League of Remembrance (1914–1919), which has developed an organisation of the utmost value to the 400 institutions which have sought its help. The League has twice had to move into larger premises, and now occupies a beautiful house at 48, Bryanston-square, London, W. 1. Here workrooms are provided where garments, surgical dressings, swabs, and linen articles are made up gratis from materials sent by hospitals and strictly according to the patterns supplied. The funds for payment of the "remembrance workers" (widows or dependants of officers) in charge of each batch of voluntary workers and for the administrative expenses are supplied by subscribers to the League, of which the annual budget is well over £3000. Last year 350 appeals for assistance were received from hospitals and over 60,000 articles were delivered. In response to a request from Guy's Hospital the League has now undertaken to make over 170,000 theatre sponges annually, a regular supply of 3400 being despatched every week. This commitment necessitated the enlistment of a special staff for the work, and arrangements are being made, in conjunction with matrons of the London hospitals, to appoint to the staff of the League 12 *accepted* candidates for the nursing profession who are too young to be admitted, or are awaiting a vacancy in the hospital preliminary training school. Candidates must as a rule be over 18 years of age and must undertake to stay for approximately an academic year—i.e., from October to July inclusive, unless called up by their future matrons to fill an unexpected vacancy. Time will be allowed for attendance at lectures on the recommendation of the matrons concerned. The work of the girls will include the making of hospital dressings, bandages, garments, and ward equipment; they will also, by assisting in the various departments of the League, gain an insight into methods of management, discipline, office work, reception, catering, still room, and other duties. They will provide their own simple uniform (brown overalls and caps), and will receive board residence and pocket money (£12 a year). The scheme is welcome not only as a sign of the growing activities of an admirable organisation of voluntary labour but also in so far as it will enable at least a few candidates for the nursing profession to bridge the gap between leaving school and entering hospital. Further particulars of the work of the League can be obtained from its honorary administrator, Mrs. E. H. Gibson.

RECURRENT PNEUMONIA

THE attacks of bacteria or viruses usually leave the patient with immunity or resistance to subsequent infection by the same organism; but there are many exceptions to this rule—notably, erysipelas, acute rheumatic fever, and pneumonia. Indeed, it seems that one attack of these diseases predisposes to others of the same kind. In pneumonia a history of previous attacks has been noted by various authors in from 13 to 31 per cent. of cases, and instances of repeated recurrence are often quoted. Various explanations have been suggested, such as constitutional predisposition to pneumonia, local loss of resistance in a lobe once affected, and persistence of the infecting organism. More recently the suggestion has been put forward (R. Cole,[1] R. Cruickshank [2]) that each attack of lobar pneumonia is due to a different specific type of the pneumococcus, of which, as we now know, there are many. This theory has been examined by M. Finland and H. W. Winkler [3] in a review of 57 cases, mostly adult. Among the features considered are the character and location of the pneumonia in each of the illnesses, the length of interval between them, the bacteriological findings, and the effect of specific serum therapy. Regarding the character of the pulmonary lesion, Finland and Winkler include—rather unwisely perhaps in view of the difference in pathogenesis between broncho- and lobar pneumonia—cases in which either at the first or second attack the infection was broncho-pneumonic in type; they make the interesting

[1] Nelson's Loose Leaf Living Medicine. London, 1920, vol. i., p. 208.
[2] The Milroy Lectures, THE LANCET, 1933, i., 563.
[3] Amer. Jour. Med. Sci., September, 1934, p. 309.

observation that a large number of patients, primarily affected with lobar pneumonia, had more extensive and "atypical" lesions during the recurrent attack. Recurrences are certainly common in the pneumonias of children, where broncho-pneumonia is the predominant lesion; for example, Ford[4] in a follow-up of 184 children with pneumonia reports recurrent attacks in 51, the predisposing factors being persistent infection of the upper respiratory tract and an inadequate period of convalescence.

When they come to the bacteriological data, Finland and Winkler record seven cases in which the second attack was apparently due to the same specific type of pneumococcus (I., II., or III.) as caused the first infection. Thus, although in three of the seven cases the recurrence was broncho-pneumonic in type, the belief that recurrent attacks of lobar pneumonia are always due to different serological types of the pneumococcus does not seem to be tenable. Two noteworthy points emerge from an analysis of these cases: in four patients the reinfection occurred within a year's time (4 weeks, 6 weeks, 7 months, 9 months) and each of them was treated with specific antiserum in the first attack. These facts make one ask whether the recurrence was associated with the persistence of the original infecting organism in the throat (since Cruickshank has shown that chronic carriers of types I. and II. pneumococci are not uncommon) and whether serum treatment interferes with the natural development of immunity. Finland and Winkler also show that the sites of the pulmonary lesion and the infecting types of pneumococcus, both in the early and late attacks, are very similar to those usually observed in pneumococcal pneumonia. The impression is left that while first attacks of lobar pneumonia lessen local resistance and so predispose to broncho-pneumonia, there is also a constitutional predisposition to pneumonia which results in recurrent infection, usually with serologically different types of the pneumococcus.

COMMON SALT IN ADDISON'S DISEASE

EARLY this year[5] we reviewed briefly the relation of the suprarenal bodies to sodium metabolism, and drew attention to the claims of several American authors that exhibition of sodium chloride is capable of relieving the symptoms of Addison's disease. In confirmation of these claims two case reports have since been published in our columns.[6] Both these cases presented the features typical of Addison's disease; both showed marked symptomatic improvement on receiving sodium chloride; but, whereas in Dr. Sears' case the blood sodium was raised from a subnormal to a supranormal figure by treatment, in Dr. Hinds Howell's case it was only slightly below the normal level before treatment, and was unaffected by the administration of salt, although symptoms were greatly ameliorated. The explanation of the differences between these two cases is obscure. Possibly the sodium : potassium ratio is of importance, for in the first case the reduction in the blood potassium while the patient was receiving salt was even more striking than the increase in the blood sodium; in the second case figures for potassium are not given. Whatever the interpretation of the findings, the important fact is that both patients improved with salt.

An extension of the uses of salt in this disease is suggested by Dr. W. S. Nettrour and Dr. E. H. Rynearson, of the Mayo Clinic,[7] who have used a salt-free diet as a provocative test for Addison's disease. Harrop, Weinstein, Soffer, and Trescher suggested the possibility of this test last year,[8] but Nettrour and Rynearson appear to have been the first to record its employment. Their patient had features suggestive of Addison's disease but no pigmentation; a few days on a salt-free diet greatly aggravated the symptoms, and the subsequent administration of large doses of salt was followed by their complete alleviation. Cases where Addison's disease is suspected but cannot be proved are not uncommon, and a reliable diagnostic test would certainly be of value. A possible snag about this one is that not all cases of Addison's disease do not respond to salt, and would presumably not react in a typical way to its withdrawal from the diet. Moreover, the case reported by Nettrour and Rynearson suggests that salt-free diet is not without dangers as it may produce a severe relapse which, if it has no more serious effects, greatly increases the patient's discomfort. One is tempted to add that as a rule it would be more humane to determine whether large doses of salt would ameliorate the symptoms before seeing if deprivation of it would aggravate them. Nettrour and Rynearson disclaim any opinion on the reliability of the test, but record the valuable observation that in this particular case it established the diagnosis.

MISTAKEN IDENTITY

THE possibility of mixing babies born in a maternity home or hospital is generally recognised, and in the United States, where these institutions are often on a large scale, various systems of identification have been devised from time to time to ensure that the babies are handed to the right parents. The problem of preventing such confusion in a grave emergency arose in a famous London maternity hospital during the war, when a bomb was dropped within a few hundred yards of its building. The mothers were taken by lift to the basement while batches of babies were hurried down the stairs in the arms of students and nurses. No catastrophe occurred but a system was devised to meet such emergencies in the future. In 1928, at the end of 28 years' experience at the head of obstetric service in five different hospitals, Dr. J. B. DeLee, of Chicago, came to the conclusion that no single method of marking was absolutely safe; but he was able to describe arrangements which went a long way towards making identification automatic and independent of human forethought.[9] The ritual involved the use of three sterile tapes, an aluminium tag, and an adhesive plaster, all numbered (the numbers being read aloud by three separate assistants), a telephone message to the parents, and footprints taken in duplicate. The method seemed as free from loophole for error as human ingenuity could make it. Two years later the famous Watkins and Bamberger infants appeared in Chicago, though not in Dr. DeLee's institution. The babies went home on the ninth day, after which each was discovered to be marked with a tiny piece of adhesive tape bearing the other's name. After the health commissioner, 13 medical experts, and two family practitioners had tried to sort out the tangle, the parents decided to ignore the lot, and to be guided by the shape of the infants' heads, one being of Semitic and the other of Caucasian race. But even so they changed their minds a few weeks

[4] Glasgow Med. Jour., August, 1934 (Proc. Roy. Med.-Chir. Soc., p. 147).
[5] THE LANCET, 1934, i., 137.
[6] Ibid., 1934, i., 950 and 1116.
[7] Proc. Staff Meetings, Mayo Clin., Sept. 12th, 1934, p. 550.
[8] Jour. Amer. Med. Assoc., 1933, C., 1850.
[9] See THE LANCET, 1928, i., 666.

later and exchanged the babies. Now the same problem has arisen in a Liverpool corporation hospital in connexion with an older child. Dorothy Price, aged 1 year and 9 months, was sent to Belmont-road Hospital, from which she was transferred, six weeks later, to Fazackerley Hospital for treatment for diphtheria. At the end of another six weeks the parents were notified that the child was well, and she was taken home by Mrs. Price. The father, however, had some suspicion that she was not his daughter. Three weeks later she was fetched away in a car and, in Mr. Price's presence, handed over to another man of the same name. A second child, also named Dorothy Price, was offered to the parents, but they stated she was not their child and refused to accept her. An interesting point is that the original Dorothy Price showed great reluctance to go home with the woman who purported to be her mother.

New-born babies are apt to be very much alike, but it seems almost incredible that a child of 21 months should not have developed characteristics which would make her easily identifiable by her own parents, even after an absence of three months, and it is hardly reasonable to expect a hospital to carry out a system of identification for every patient of whatever age. In the case in question the mistake apparently arose at the Belmont-road Hospital, where two little girls of the same name were admitted at about the same time—though there was six months difference in their ages. One developed diphtheria and had to be transferred to the Fazackerley Hospital, and the address of the other was accidentally sent with her. The Fazackerley Hospital is thus entirely exonerated, as it had no knowledge even of the existence of the other child.

A subcommittee of the port sanitary and hospitals committee held an inquiry at the Belmont-road Hospital, and found that the arrangements for transfer and discharge of patients were such that accidents of this kind were impossible if those in charge carried out their duties satisfactorily.

"On admission a tape bearing the child's name is attached to its ankle. A record paper with the child's full name and address is fixed over the bed and an identification card bearing the child's full name and address, age, and names of parents is filed in a cabinet. When the child is transferred from the institution the record paper, identification card, and tape on the child's ankle should be compared before the transfer papers are made out."

Failure of the human element was responsible for the present incident, proper precautions not having been taken, and the defaulting parties had been cautioned. The chairman of the subcommittee said the parents of Dorothy Price were now satisfied that the child in Belmont-road Hospital was theirs. Perhaps the only perfectly safe way of guarding against mistaken identity would be to register finger-prints of all patients at the time of admission. But this, except for infants, is a counsel of perfection.

POLIOMYELITIS SERUM

A WEEK or two ago the newspapers contained a harrowing account of efforts made by a hospital to secure serum for the treatment of a patient with acute anterior poliomyelitis. Those who may at some time need such serum may like to be reminded of two sources from which it can be got. For the pooled serum of convalescents application may be made to the medical superintendent of the Western Hospital, Seagrave-road, Fulham, London, S.W.6, who is in a position to supply outfits, each sufficient for one patient, on condition that a full account of the case and the results of treatment are later furnished to the secretary of the Medical Research Council by the practitioner responsible. This serum, which is prepared by the Lister Institute (Elstree) and is issued in coöperation with the Medical Research Council and the London County Council, is intended solely for the treatment of cases in the preparalytic stage of illness. For prophylaxis an antiserum has been prepared, also at the Lister Institute, by immunising horses, and an intramuscular dose of 5 c.cm. is recommended for the protection of those exposed to infection—especially contacts during an epidemic. As was mentioned in our issue of Sept. 15th, a supply has lately been sent from Elstree for use in an outbreak of poliomyelitis in Denmark. The Institute's immune horse serum may be bought through Messrs. Allen and Hanburys Ltd.

AT the Royal College of Physicians of London Dr. J. H. Sheldon will deliver the Bradshaw lecture, on hæmochromatosis, on Thursday, Nov. 1st, and Sir Humphry Rolleston the FitzPatrick lectures, on the history of the endocrine organs, on Tuesday the 6th and Thursday the 8th. Both lectures will be given in the College at 5 P.M., and any member of the medical profession will be admitted on presentation of a card.

ON Thursday, Nov. 1st, at 5 P.M., at the house of the Royal Society of Medicine, Mr. Herbert Tilley, consulting surgeon to the ear and throat department of University College Hospital, will deliver the Semon lecture for 1934. His subject is to be inflammation of the maxillary antrum and other accessory sinuses (some clinical manifestations of its pathology), and the chair will be taken by Mr. W. M. Mollison.

A CIRCULAR has been received by members of the medical profession in which Sir Henry Brackenbury and Mr. Bishop Harman set out their hope to be again supported by the suffrages of the profession in their position as Direct Representatives on the General Medical Council. The claims of both are obvious. We understand that the President of the Council is also proposing to submit his name for the position of Direct Representative for Scotland. It would be a graceful recognition of Sir Norman Walker's stirling services to the profession if his election were unopposed.

HANDICRAFTS AT TUBERCULOSIS DISPENSARIES.—On Wednesday, Oct. 24th, at 3.30 P.M., the Lord Mayor of London will open an exhibition of handicrafts made by students attending classes at 13 tuberculosis dispensaries in London. On Thursday at the same hour it will be opened by Lord Snell, chairman of the London County Council, when an address will be delivered by Sir Henry Gauvain. Working demonstrations will be given in the course of the afternoon and the products will be on sale "guaranteed," it is stated, "free of infection." Further particulars from the hon. secretary, Standing Conference of Metropolitan Borough Tuberculosis Care Committees, Pembury, The Drive, Rickmansworth.

YORK COUNTY HOSPITAL.—The Princess Royal last week opened a new out-patients' department and a women's surgical ward in this hospital. The cost has been £25,000, not all of which has yet been raised; £500 has been given by the honorary medical and surgical staff.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XXIII.—PROGNOSIS IN HYSTERIA AND ANXIETY STATES

IT is of interest when reading contributions on the subject of prognosis to note that nearly every author is compelled to make constant reference to treatment. Therapeutics are scoffed at so often that it is gratifying to find that hardly anyone is in a position to discuss prognosis helpfully without doing this. It has been made abundantly clear in previous articles in this series that in many illnesses prognosis depends not only on the nature of the illness but on the facilities for treatment which can be afforded. There are of course certain conditions such as coryza where, whatever is done, it is as near certainty as possible that the patient will become quite well; there are others, like established hydrophobia, where it is almost equally certain that he will die; but for probably a majority of illnesses prognosis depends to a great extent on treatment, and certainly this is true of the two psychoneuroses—hysteria and anxiety states.

ENVIRONMENT

To a considerable extent, no doubt, the environment of the patient must play a part in the determination of the result, as must also his make-up. The presence in the home of a drunken bullying spouse may nullify any treatment however wisely conceived and skilfully carried out; and there are many what one may call high-grade defectives who find life extremely difficult, and for whom neurosis affords an escape from its trials. But to a far greater extent than is, I think, appreciated the prognosis depends on treatment. After treatment the most impossible relatives can often be tolerated; if they cannot, treatment may enable the hitherto patient underdog to leave the bully. Even a mental defective may be helped by being placed in a special environment where the strains and stresses to which he is subjected will be constantly modified in his favour, so that his life may succeed on a less strenuous basis. Such a person may then for years appear to be normal. It is obvious that treatment of the relatives is often as necessary as treatment of the patients. If they can be got to see—as they often can—that their own conduct has helped to precipitate the patient into the morass in which he now is, the prognosis will be decidedly improved.

At one time I had hoped to be able to give figures which might be of statistical value in helping to solve the problem of the prognosis in these disorders after treatment. Every patient who has passed through the Cassel Hospital for the last 13 years has subsequently received an annual inquiry about his health, and the replies have been recorded and tabulated. However, the number of answers received from those who were no longer recent patients was too small to found a basis for statistics. Results known for a year or two only are of little value. Almost any kind of treatment will be followed by recovery in large numbers of neurotics, and such states of well-being may easily last for a year or two. In the present stage of psychotherapy these temporary recoveries are of little interest. What interests everyone who is occupied in the treatment of these patients is whether it is possible to make such fundamental changes in a patient that he can be relied on not to be subject to neurotic illness in the future. It seems fairly certain that the person who is cured by what may be termed irrational therapy, such as electricity or some other agent of whose mode of action we are ignorant, is less likely to keep permanently well than one whose case has been dealt with on rational lines. "Permanent" is a strong word. We shall see presently to what extent its use can be justified in this connexion. I think we may say that without doubt it is possible so to change an individual patient so that he will not be liable to break down in future. By this is meant that the patient should be changed in character in such a way that he does not take refuge in illness every time that life becomes exceptionally troublesome. Here we may find that a too short follow-up may give us results which are unjustifiably gloomy, for a character change in a favourable direction may be started by the doctor, but may be of slow growth, the full results not being displayed for a year or two.

There is one thing further which must be said with regard to the interpretation of after-histories—viz., that it is easy, unless one is alert, to include examples of the manic-depressive psychosis in our lists. The recovery of these patients, of course, is quite independent of treatment, and it is not always easy to be sure from which disorder—psychosis or neurosis—a given patient is suffering. There are, however, a sufficient number of clear-cut cases of neurosis where it is quite certain that the condition is not that of psychosis, to give us a basis for knowing whether or not these patients are curable in the sense that they can be so changed that they do not relapse.

THE CRITERION OF RECOVERY

Though after-histories cannot be used to establish percentages of recoveries, they do show definitely that such changes may occur in certain patients so that these do not tend in future to have recurrence of their nervous disorders.

What is to be the criterion of recovery—to what extent can the subject of severe neurosis become really well? There is no doubt that a considerable proportion can become as well as any of us are.

A woman of 44 who for 20 years had been going from one rest cure to another, unable at any time in all these years to dust a room without having to go to bed for three weeks after it, thinking of nothing but her health, of what she dare do and what she dare not do. After six weeks of treatment, which consisted of half-hour conversations—not every day—she became well. She has remained so for 13 years. The word "permanent" seems as applicable to this example as anywhere in medicine. This was certainly not a psychosis. There was a character change effected. By "well" I mean that she behaves like anyone else, runs her house successfully, and became so "unexhausted" that even during her treatment she walked 20 miles one day.

A man of 40 had been a prisoner in his brother's house for 16 years on account of agoraphobia. Even in the house he had frequent attacks of "causeless" terror. All his life he had been nervous, frequently fainting as a child and often frightened. During the last 16 years his life had been completely spoilt. After three months of treatment, also 13 years ago, he became quite well and has remained so. He can go where he likes and has no terrors.

These are the results we may look for. I do not say we should expect such complete recovery in cases of this severity, though this is not uncommon. In most instances we may look for great improvement.

IMPORTANT FACTORS

It is commonly said that the age of the patient and duration of symptoms are of importance in prognosis. Neither of the patients mentioned was young, and both had been ill for a long time. Patients recover at all ages, but apparently age may make things more difficult, because the older one gets the less there may be to look forward to. Thus a man, a bachelor who had sold his business 16 years before coming under treatment because he had fallen ill, had little to look forward to: he was about 45, and felt he could not start again. Again, with a woman at the menopause who had been afraid of marriage, though she wanted children very much, it was too late for her to get what she wanted even if her fears were removed. It is not the age of such people but the absence of a future which makes them difficult to treat. The patients who recover usually have strong reasons for wishing to get well, and this applies to the two examples I have quoted.

With regard to duration of symptoms a difficulty frequently presents itself in early cases, although everyone professes to hanker after them for treatment. Patients who have been ill for a short time only are apt to resent a therapy which proposes a character change. For many the illness is not so distressing as to compel them to seek to undergo so disagreeable a process. For others the illness is what has been called "a convenient arrangement." It is after they have been ill for a considerable time and the inconveniences of being ill become more and more manifest that coöperation is often easier to obtain.

What then are the factors of importance in prognosis? They are to be found not only in the patient but also in the doctor; for curable cases the most important factors reside probably in the latter. He must be able to believe that it is possible to help these patients to such an extent that they may become quite well. If he doubts the possibility of this he will not have the satisfaction of seeing them become well. For many doctors this is a difficult postulate. Much of their training has led them to scepticism; they have been sedulously taught to distrust therapeutic agents; they have almost always been taught that it is extremely bad form to say—and I judge even to think—that they "cure" anybody. They must never claim cures. And this is probably a principal reason why many neurotics are helped so much by quacks of all sorts. The quack does not doubt that he can cure nor let the patient forget it. The duration of his cure is, I think, only a short one; but if he had no success at all no one would go to him. We need not really claim to do more than Ambroise Paré did, but we might claim at least as much, with good consciences—viz., that our dressing of the wound is of some importance.

Some of the factors in the patient have been indicated already. They may be in consciousness, although the patient has not correlated them with the fact that he is ill. For many patients there is, as we have seen, an apparent advantage in illness—the war cases and the civilian compensation cases provide the grossest examples of this. By illness the patient may be successfully shirking painful or merely tedious duties, or getting away from a distasteful environment. In many instances frank discussion of these things may result in such character change that in future this bad method of dealing with difficulties is no longer resorted to. I have found in my own practice that when this line of treatment succeeds there is often a change of a lasting character.

The difficulty may, however, be one which is unconscious and not at first obvious to the doctor. Prognosis will then depend on (1) whether the difficulties can be brought into consciousness, and (2) whether they can be dealt with successfully by the patient if they are so brought. I do not believe that the mere bringing of them into consciousness is enough; and the warning must be given that if an unconscious trouble is made conscious and is then found to be of a kind with which the patient cannot deal, to which he cannot reconcile himself, his condition may be made much worse, not only for the time being but permanently. This is not to condemn analysis of the unconscious, but to emphasise that it is a difficult and delicate procedure, something analogous to a surgical operation and to be done with a sense of grave responsibility.

ANOREXIA NEUROSA

There is one small subdivision of the psychoneuroses where I am able to give more exact figures, that of the patients with anorexia nervosa. In the last 12 years I have had under my care 19 patients with the strictly classical symptoms of that disorder—viz., anorexia, amenorrhœa, emaciation, all present in young unmarried women. It is known that 15 of these are now well. Two have been well for nine years, three for eight years, and the remainder for lesser times. Two have been lost sight of. Two are dead, one, after five years of good health, from septicæmia; the other from a relapse of anorexia. In all these examples the treatment was rest in bed, full feeding, and therapeutic talks on the conscious level.

THE TIME FACTOR

There is one more point. It is often said that the treatment of these patients takes endless time. Except where a formal analysis of the unconscious has been undertaken, a large proportion of my successful cases have been short. Out of 250 patients who to my knowledge have been well for at least three years—many of them for much longer—100 were treated for less than three months, 50 for less than six weeks. They were not seen every day; their periods of treatment were often not more than half an hour at a time. It is not length of treatment, but how far one can change fundamental ideas that matters.

T. A. Ross, M.D., F.R.C.P.,
Late Medical Director of the Cassel Hospital for Functional Nervous Disorders.

HOSPITAL EXTENSIONS.—The Marchioness of Cambridge recently opened a maternity block which, at a cost of £3900, has been added to the Bridgnorth and South Shropshire Infirmary. The building includes a main ward with six beds, a labour ward, two private wards, an isolation ward, and a nursery.—The Duchess of Rutland has opened at the Rutland Memorial Cottage Hospital, Oakham, a small wing consisting of a children's ward of five beds. Against each bed an electric light has been inset in the wall about a foot from the floor to serve as a night light which will not shine on the patient's face.—The extensions of Aldershot Hospital have been completed by the opening by Mrs. R. Alexander of a children's ward of ten cots, with room, in an emergency, for nearly double that number.

AN ANNEXE TO PRESTON HALL.—The British Legion on Oct. 1st took over Douglas House, Bournemouth, which will form a seaside annexe to the institution at Preston Hall. Douglas House has hitherto been administered by the United Services Fund as a convalescent centre for tuberculous ex-Service men. It will add 75 beds to the number already available at Preston Hall.

POST-GRADUATE LECTURES

As in our two last issues, we publish summaries of some of the lectures given this autumn at post-graduate courses in the London teaching hospitals. Mr. Bourne's and Dr. Clark-Kennedy's were delivered at St. Mary's, and Dr. Himsworth's at University College Hospital.

LABOUR—THE SUPREME DIFFICULTY

(MR. ALECK BOURNE)

CONTRARY to widely held views and teaching, the chief difficulties of labour are due to disorders of *function* as opposed to those of mechanics. A superficial view of labour regards it as chiefly a mechanical process, to be treated by mechanical methods—whence the surgical turn of mind of many of those who practise obstetrics. Conditions of labour, at first sight purely mechanical, cause difficulties rather by an associated failure of function than by abnormal mechanics.

By function I mean uterine contractions and coördinated relaxation of the cervix and perineum. Failure of adequate contractions I regard as the supreme difficulty in labour. Even such abnormalities as contracted pelvis, placenta prævia, occipito-posterior and breech labour—conditions which appear to be purely mechanical—are largely overcome provided the contractions are strong, that is by good function. For example, the majority of women with pelvic contraction will pass the average-sized fœtal head provided contractions are strong enough to mould the head; the bleeding caused by placenta prævia will be controlled if contractions are sufficiently strong to press the presenting part down on the bleeding area, and it is a common experience that the posterior position of the occiput can be rotated, after flexion, by the uterus when acting strongly. Further, all the indirect troubles caused by delayed labour such as exhaustion, dead fœtus, sepsis and lacerations due to manipulations necessary for expediting labour, and often serious hæmorrhage, must be set down to feeble, inadequate contractions.

It is not too much to say that could the force of uterine contractions be properly controlled—in either direction of increase or decrease—by simple drug or other treatment, a very large amount of obstetric difficulty and danger would entirely disappear.

Inertia is common in its minor forms. It requires little treatment and is of no danger to either mother or child. If, however, labour endures for more than 48 hours, anxiety often begins, risks become more and more likely, and the difficult question of interference will arise. It may be of interest to look at the incidence of inertia. In conjunction with A. C. Bell, I analysed the records of over 4500 consecutive cases of labour at Queen Charlotte's Hospital and found that delay of more than 48 hours due to inertia occurred at the rate of 1 in 150 labours, but of emergency admissions the rate rose to 1 in 18. More than half the cases (49) were between the ages of 20 and 30, while only two occurred after 40 years. Primiparity has an important influence. No less than 88 per cent. of the cases were primiparæ, which is in accord with our common experience. Expressed in another way 1 in 60 primiparæ and 1 in 300 multiparæ suffer from severe inertia.

A point of considerable importance is the possibility of the recurrence of inertia in subsequent labours. If a woman has suffered all the pain and exhaustion of delay in her first labour she is naturally apprehensive of similar trouble in subsequent confinements. It is therefore important, if possible, to be able to reassure her on this point. The figures show that it is unlikely that inertia will be repeated, but on the other hand a woman who has had a normal first labour may yet have a prolonged subsequent labour.

Normal presentations were found in nearly three-quarters of the cases, and twins only formed 2 per cent. of the cases. The breech presented in only 6 per cent. Organic complications of pregnancy were uncommon except albuminuria, which happened in 18 per cent.—i.e., nearly 1 in every 5 cases. This high incidence may be related to the influence of induction on the length of labour, which is often performed for albuminuria. Of the 49 cases, 25 per cent. followed induction of labour, which is a sufficiently high proportion to incriminate induction as a cause of inertia. Incidentally, this is a strong point against induction of labour as a treatment for contracted pelvis, where strong contractions are particularly necessary. Premature rupture of the membranes occurred in 60 per cent. of all the cases, but my experience makes me doubtful whether simple premature rupture of the membranes in an otherwise normal case tends to lengthen labour. It is a well-known clinical fact that pure inertia is usually a complication of the first stage of labour. It is supported by our own observations, which found that in 22 out of 47 cases the second stage did not exceed the normal duration and was followed by spontaneous delivery.

Despite the vast amount of clinical observation of labour and laboratory work on the contracting uterine muscles we know very little of the cause of inhibition of the uterus. It cannot be that the uterine muscle is feeble or incapable of contracting, for we often find a quick second stage following a first stage that has lasted some days, and also the same uterus will contract normally in subsequent labours. Similarly, though cervical spasm does occasionally prevent dilatation, manual exploration of the cervix under anæsthesia usually finds it unexpectedly soft and dilatable, especially after many hours have passed. Graphic analysis of human uterine contractions which I have made with Dr. J. H. Burn shows the sluggish uterus to be contracting irregularly in both time and force. The summit of the contraction wave is sharp, showing that the uterus does not hold on during its systole. Speculation on the cause of uterine inhibition suggests that one or two factors are at work. First, it seems certain that an active nervous inhibition by way of the sympathetic plays a real part, and secondly, it is probable that the muscle is in some way comparatively insensitive to the stimulating influence of the posterior pituitary hormone. It is my experience that cases of real inertia do not respond to ordinary doses of pituitrin, in contradistinction to normal labour.

We have two experimental observations on the human uterus in labour that are fundamental. The first is that adrenaline injected during labour abolishes contractions entirely, suggesting strongly that the sympathetic inhibits the uterus, and secondly, that pituitrin stimulates the force and frequency of contractions. A later observation is that acetylcholine, which is selectively stimulating to the parasympathetic, augments contractions for a short time after injection. Apart from these facts we have

little exact knowledge and experimental guidance on which treatment can be based.

The results of severe inertia are serious to both mother and child. Of the mothers five died (10 per cent.); three of the deaths were due to sepsis and two were ascribed to chloroform poisoning. In addition to the five fatal cases, 14 (28 per cent.) other patients suffered from various forms of infection. Of the children 38 per cent. were stillborn, and a further 6 per cent. died just after birth. There are few other complications of labour which exact so heavy a toll of maternal life as inertia, for it is indirectly responsible for hæmorrhage, sepsis, and injuries. A woman in severe inertia is in much greater danger than one who has a central placenta prævia or post-partum hæmorrhage, the mortalities for which in 1932 at Queen Charlotte's Hospital were 7·7 per cent. and 2·8 per cent. respectively.

The diagnosis of the cause of delay in labour is important. All cases may roughly be divided into two large groups, first, those whose delay is due to feeble contractions (true inertia), and secondly, a smaller group in which these contractions are normal or strong, but some mechanical difficulty exists which prevents advance. The two groups are not always easy to distinguish because the patient may react strongly to contractions which are mechanically inefficient, though very painful. Vaginal examination will give the information we need by revealing either no evidence of pressure or else all the signs of pressure easily appreciable. Thus in the first group there will be no caput, no overlapping of the sutures, and no œdema of the anterior lip of the cervix. In the second group these features (œdema, &c.) will be obvious, and we know that the uterus has been contracting strongly for many hours.

To-day we are concerned with the first group. Many hours, even some days, may have passed and the os is still barely half dilated, the uterus is sluggish, the child is alive, and the mother is very tired. Two points should be kept in mind at the outset. First, we know that if all mechanical conditions such as the pelvis and presentation are normal, delivery will probably be accomplished spontaneously or by low forceps without danger to either mother or child. Secondly, we know that the oxytocic or stimulating group of drugs is disappointing, and that in a case of real inertia their effect is either negligible or too short-lived to have any useful result. Lastly, we know that on the whole more risks and dangers are incurred by manual interference than by doing nothing. Some patients must have manipulative help, but these are a minority, and even so it remains true that if victims of inertia, who have everything normal except the quality of their contractions, were all left alone to deliver themselves by the help of morphia and other sedatives, the results in the aggregate would be better than they are at present. For simple delayed dilatation we have as yet nothing better than morphia, chloral, or other sedatives. Simple nursing measures such as the aperient and enema are effective for the minor cases.

Until the membranes rupture there need be no anxiety, but after this event has been passed by some hours, fatigue and risk to the baby increase, apart from the possibility of infection. What are we to do for the comparatively rare case that resists all the ordinary treatment, assuming that the presentation is correct and the pelvis normal? There comes a moment when we feel that no further chloral will help, the patient is becoming exhausted, and the fœtal heart is suffering. At this moment, which can only be determined by experience, I believe the woman should be anæsthetised and the dilatability of the os explored by the hand. It is surprising to find how much softer it is than has been assumed. Very often it can be dilated without risk of tearing. In this case the forceps should be applied and the head held while the rim of the os is pushed up over it, first at the back, then the sides, and lastly the anterior edge. When the cervix has disappeared by this slow and careful manœuvre the head is gently pulled down and delivered slowly in order to avoid the risk of tearing of the cervix by the shoulders. Should it be impossible to dilate the os without risk of deep tears I would advise application of forceps, if the os will admit the blades, and continued traction maintained by tying a weight of about 4 to 6 lb. to the handles of the forceps. Fortunately these extremely resistant cases are rare, but when they occur they cause the gravest anxiety.

The prevention of inertia is chiefly accomplished by giving the woman confidence, that is, by removing her fear of labour during the antenatal conversations. Often this fear is suppressed by a strong mental effort, and the woman may not appear to be afraid, but when the pain of labour begins the underlying fear exerts its malign effect in causing inhibition of contractions. It is necessary not to suppress fear but to exorcise it by confident reassurance.

THE CONTROL OF DIABETIC TREATMENT

(DR. H. P. HIMSWORTH)

IN the treatment of any disease it is customary to watch closely certain symptoms and physical signs which experience has distinguished as affording indications for the modification of treatment or prognosis at that particular stage of the disorder. As the disease is brought under control the more obtrusive signs and symptoms disappear and are replaced by less obvious evidence of disordered function; and thus the different signs and symptoms assume an order of importance relative to the particular stage of the disease under consideration. Diabetes mellitus is no exception to this generalisation. In the stage of advanced coma the signs of immediate urgency are those revealing the state of the circulation; in the stage of "balancing" the most important signs are those of disordered metabolism; in the balanced diabetic patient we are concerned with the presence or absence of the sense of normal health.

Cases of coma fall into two groups. The first group is made up of cases of uncomplicated diabetic intoxication; the second group consists of those advanced cases of coma in which the severity of the diabetic intoxication is overshadowed by the impairment of the circulation. Clinically treatment of the first group falls into that of the "balancing" stage, for treatment directed solely to combating the deranged metabolism is sufficient to ensure recovery; but the second group differs in that although the deranged metabolism requires treatment as energetic as in cases of the first group, this treatment alone is not sufficient to bring about recovery unless it is combined with vigorous measures to support the failing circulation.

In these cases of coma the signs of an impaired circulation are closely connected with those of dehydration. The failing circulation is revealed by the cold extremities, weak pulse, and low blood pressure; the dehydration by the soft eyeball, inelastic skin, and dry mucous membranes. If the

patient is to recover, measures directed against these dangers must accompany those directed against the disordered metabolism. The patient is laid flat, the foot of the bed raised, warmth applied, and oxygen administered. Large quantities of fluid are given *slowly* intravenously. A rate of two pints in 1½ hours is quite fast enough, as a more rapid introduction of fluid may cause the heart to stop. Personally I give 10 per cent. glucose in normal saline intravenously (glucose 2½ ounces, salt 1 drachm, water to the pint) and thus combine the treatment of the diabetes with the treatment of the circulatory failure. Lawrence advises hypertonic saline and in some cases 7 per cent. gum arabic solution, whilst Hetzel suggests blood transfusion for desperate cases. Drugs are of little avail. Adrenaline ℥ 5 intravenously has been recommended, but I am of the opinion that insulin given intravenously has the most beneficial effect. In a favourable case the circulation will be found to improve before the patient regains consciousness, but it will be some considerable time before all the signs of dehydration have disappeared.

The stage dominated by the circulatory picture being passed, the signs of disordered metabolism assume the place of importance. This second stage includes all cases from that of diabetic intoxication (ketosis) without circulatory failure up to the balanced diabetic. I now wish to discuss the relative value of the signs concerned.

To be of any use the guiding sign must satisfy two criteria: (1) it must agree with the clinical findings; (2) it must indicate whether the disease is progressing or retrogressing.

From the practical point of view there are three main tests by which we can gain an insight into the degree of metabolic derangement at any particular time. These tests are the estimation of the blood-sugar, the testing of the urine for sugar, and the testing of the urine for ketones.

The estimation of the blood-sugar is by most authorities regarded as the method of choice. If we apply the first criterion, we find that this test immediately fails. In coma we see the culmination of the diabetic processes and one would expect some correlation between the height of the blood-sugar and the degree of coma. One has only to examine a series of cases of coma to see that no such correlation exists. The blood-sugar may be anything from 2000 to 200 mg. per 100 c.cm. But diabetics are often encountered, up and about, with blood-sugars far above 200 mg. per 100 c.cm., and I have seen a perfectly conscious diabetic admitted to hospital with a blood-sugar approaching 900 mg. The test similarly fails to satisfy the second criterion, that it should indicate whether the patient is improving or regressing. Some time ago a patient was admitted to this hospital in full coma with a blood-sugar value of 350 mg. per 100 c.cm., and an hour after intensive treatment was stopped she was talking sensibly, though her blood-sugar level was 1200 mg. per 100 c.cm. In this case the change in glycæmia was in exactly the opposite direction to the change in the clinical condition. In an out-patient clinic diabetics with blood-sugars constantly above normal are not uncommon. Provided other more important factors are kept in check, it has been my experience that they come to no harm. It thus appears that the blood-sugar value satisfies neither of the criteria required by an ideal sign. The utmost we can say for the test is that if a series of estimations show a steadily rising blood-sugar, then the patient is probably getting worse—a piece of information that can be obtained quite as easily by noting the appearance and subsequent increase of glycosuria.

As regards glycosuria I may say at once that the *amount* of sugar excreted depends mainly upon the urine output of the patient, whilst the *concentration* of urine sugar reflects the variation in blood-sugar. The objections we have advanced against attaching importance to the blood-sugar apply similarly to the urine sugar. It has, however, two points in its favour. Glycosuria indicates a waste of sugar in the urine and as such it should be stopped. Appearance of glycosuria in a patient previously sugar-free indicates that that patient may possibly, but not probably, be entering on an exacerbation of his disease.

And now with regard to ketonuria. We have two tests at our disposal for detecting this condition, the ferric chloride reaction and the nitroprusside reaction. It is worth remembering that the former detects ketone bodies in concentrations of 1 in 1400, whilst the latter detects concentrations up to 1 in 200,000. A rough idea of the degree of ketonuria can thus easily be gained.

The association of diabetic coma and ketonuria is established beyond all reasonable doubt. The increase of ketone bodies in the urine heralds its approach; their presence in quantity characterises its presence; their diminution presages its recovery. The non-comatose patient always feels and looks ill if he has much ketonuria. If the diabetic is feeling relatively well yet ketone bodies are appearing in the urine in increasing amounts, then that patient invariably becomes ill. Even if ketonuria persists in small amounts the patient never feels as well as he might. Lastly, if ketonuria is abolished by appropriate treatment the patient's condition always improves, no matter what the height of the blood-sugar or the degree of glycosuria. It appears, therefore, that the test for ketonuria satisfies our two criteria of the ideal sign.

One final comparison of the three tests may be instructive. If a moderately severe diabetic is starved his blood-sugar can be reduced to normal and his urine rendered sugar-free. Is that patient clinically relatively healthy? He most emphatically is not, and the presence of ketone bodies in his urine will support this decision.

We may conclude, therefore, that of the three tests of disturbed metabolic function in a proved case of diabetes the information yielded by a knowledge of the blood-sugar is for practical purposes negligible, the little information that it is capable of giving being more easily obtained by testing the urine for sugar, but that a knowledge of the degree of ketonuria gives the most accurate idea of the clinical condition of the patient and the course which the disease will take. The necessary treatment is thus clearly indicated. *Abolish every trace of ketonuria so as to remove the patient from the essential dangers of his disease.* Next, at your leisure, attempt to stop the waste of sugar in the urine, but if this is impossible without exposing the patient to the danger of hypoglycæmic attacks do not worry; he may pass sugar for the whole 24 hours without coming to any harm if his urine remains consistently ketone-free.

When our tests for deranged metabolism indicate that the disease processes are approaching adjustment, we enter on the third stage of treatment. The immediate dangers of diabetes are now behind us and we are faced with the problem of restoring to the patient that feeling of normal health to which he was accustomed prior to his illness. The restoration of this feeling does not automatically follow the

disappearance of the chemical signs of diabetes mellitus. This point is insufficiently realised. It is far too commonly assumed that, because no chemical tests indicating abnormality can be obtained from a particular patient, then that patient must be well despite his protests to the contrary. If a patient with uncomplicated diabetes does not experience a normal sense of health, then the treatment of that patient is at fault, however perfect the chemical findings.

The commonest cause of a feeling of impaired health in a patient with no chemical signs to justify its presence is the inappropriate nature of the diet. In my experience the fault is always the same: the diet contains too little carbohydrate and too much fat. In an endeavour either to keep the blood-sugar normal or the urine sugar-free, the carbohydrate is cut down and the calorie requirement made up with fat. If this method succeeds the patient is as badly off as he would have been in the pre-insulin era; if it does not succeed he is usually worse off, for in addition to supporting his ill-health he has to receive injections of insulin. In these latter cases, nine times out of ten, insulin is given until the abnormal signs disappear and no attempt is made to take full advantage of the insulin by giving a more reasonable diet. The result is that although the patient is prevented from lapsing into coma, he exists in a state of chronic ill-health. No patient with diabetes can feel well on such an abnormal diet or experience the full benefits of insulin action. To achieve a good clinical result an adequate amount of carbohydrate must be given and I advise that the diabetic's diet contain about twice as much carbohydrate as it does fat. If an old-standing diabetic is changed to such a diet it is not long before his increased sense of physical well-being testifies to the beneficial results of such treatment.

INDIGESTION

(DR. A. E. CLARK-KENNEDY)

As is the case in many common conditions, we know little about indigestion. Even the name appears to be to some extent a misnomer: actual failure to digest the food is rare except in acute diseases and infants. The symptoms of chronic dyspepsia in adults, to which I propose to confine my lecture, are largely due to disordered mechanics of the gut. Pain is due to spasm, flatulence to air-swallowing, and fullness to lack of gastric tone. But the patient thinks of indigestion as chemical and may starve himself by over-dieting and become anæmic.

When a patient complains of indigestion the first thing is to decide whether the symptoms originate in the stomach and duodenum or in the colon. Apart from recurrent subacute appendicitis, the small intestine rarely gives rise to chronic trouble. Gastro-duodenal symptoms are related to meals. Nausea, vomiting, and air-swallowing are common. Pain is high in the abdomen and constant in position. Colonic disorders are associated with constipation and less frequently with diarrhœa. The pain travels round the abdomen, but may be felt under the left costal margin; and on account of the gastro-colic reflex may occur particularly after meals. This makes the diagnosis difficult, and many cases labelled gastric ulcer are really suffering from spastic colon.

Having localised the disorder of function the next step is to decide its pathogenesis. A simple differentiation of cases into functional and organic is inadequate. All symptoms are due to disorder of function, and disorder of function may, in general terms, be due to four causes: poor physiology, an anxiety state of the mind, hysteria, or organic disease. The all-important differential diagnosis between these four causes depends on careful history-taking; physical examination and X rays, except by excluding the grosser forms of organic disease, help little. In physiological dyspepsia the history is a long one, and the patient has often learned that certain foods upset him. It may be due to over-eating or have been precipitated by loss of teeth. Many causes are complicated by a nervous element, because the patient with a weak digestion becomes over-anxious about his symptoms. Other cases of nervous dyspepsia (anxiety neurosis with gastric symptoms) are due to fear of gastric ulcer, appendicitis, or malignant disease—often started after some trivial gastric upset by the unguarded remark of a doctor, a wrong diagnosis, or the suggestion of a friend. In such people the sympathetic is over-active. Gastric secretion and tone are therefore inhibited, with the result that when food is eaten, indigestion results. The history is usually a long one and the symptoms fluctuate and vary without definite habits being related only to the emotional condition of the individual. Nothing particular is found on examination, but the tongue is usually dirty and the abdominal wall flabby and the abdomen generally tender. In anxiety neurosis the symptoms are due to emotion acting on the sympathetic, and serve no useful purpose. In hysteria however the symptoms serve the patient's purpose who wants to be ill, and are effected through the skeleto-motor nervous system. Apart from vomiting, therefore, and possibly some cases of hysterical pain, hysteria is not a cause of indigestion. Patients with organic disease do not usually develop anxiety states with the production of neurotic symptoms, but when this does occur you are apt to miss the organic condition. Except in these difficult cases, the history is of a definite kind and the symptoms have definite habits and occur at definite times. The history is either short, or, if long, periodic, and related in an unemotional way. Examination of the patient will help you in a few cases, and it is always important to pay particular attention to the lungs as some cases of phthisis present dyspeptic symptoms. An X ray may help you, but a negative X ray does not exclude organic disease of the stomach.

You must all be familiar with the case with a rather atypical history of ulcer but which from the make-up of the individual you regard confidently as a case of organic disease. Many of these have actually had hæmatemesis and yet the X ray is negative. They do not improve if their appendices are removed, nor do they often improve after dental treatment. Their explanation probably lies in recognition of gastritis as a clinical condition. With advancing age and repeated trauma, mechanical, thermal, and chemical, the stomach becomes prone to develop gastritis. Chronic gastritis has now been demonstrated histologically, and during life by special radiographical methods, and by gastroscopy. Dr. Hurst believes gastritis, either local or general, to be the underlying cause of most gastric disorders. A patient who develops a patch of inflammation in the stomach is heading for a gastric ulcer and the symptoms will be much like chronic ulcer. A patient with a rapidly emptying hypertonic stomach and high secretion of acid who develops a patch of inflammation in the duodenum is similarly heading for a duodenal ulcer. Generalised gastritis leads to progressive reduction in gastric

secretion, and to symptoms not unlike those of carcinoma of the stomach. But in all these cases ordinary X rays will show little or nothing.

The treatment of physiological dyspepsia is to see that the patient avoids articles of diet found to upset him, to eradicate bad habits in eating, and to supply teeth if these are lacking. The treatment of a dyspepsia born of an anxiety neurosis is in the first place to avoid such diagnoses as ulcer, chronic appendicitis, and visceroptosis. Gastric ulcer is diagnosed too readily. The appendix is still removed much too frequently in people whose dyspepsia is entirely nervous. Visceroptosis, a doubtful cause of symptoms at any time, is a diagnosis from which few patients have ever recovered. Wholesale dental extraction is advised much too lightly. The next thing is to reassure the patient by careful examination, persuasion, and an X ray, if necessary, that no structural lesion is present. It must be explained that flatulence is due to air-swallowing and not to gas formed internally. Self-treatment, particularly over dieting and the taking of patent medicines, must be stopped. These patients have poor gastric tone, deficient secretion of acid, and over-secretion of mucus. A dry diet is therefore indicated. Sodium bicarbonate before meals will dissolve mucus and eliminates gastric secretion. Lastly, as these patients are highly introspective, extroversion should be encouraged, and for that there is nothing like some hobby or manual occupation. These patients require discipline rather than psycho-analysis. On the other hand patients with early organic disease, incipient gastric or duodenal ulcers, or generalised gastritis want frightening. The former will swallow medicine for a week or two but when their pain disappears they take no further precautions and no more medicine until the next attack. I am sure that such patients should be frightened into realising that they are heading straight for ulcer, and that they should exercise reasonable dietetic restriction and take alkalis between meals for at least six months or a year after all symptoms have disappeared. In this way chronic ulcers may be prevented. But you must not frighten the patient with nervous dyspepsia in this way—hence the importance of accurate diagnosis. Hurst regards chronic gastritis as a precancerous condition, and the treatment of chronic gastritis with achlorhydria as unsatisfactory. Only a few do well on acid; the majority do better on sodium bicarbonate before meals.

In conclusion let me remind you again that any disorder of function may be due to poor physiology, an anxiety state of the mind, hysteria, organic disease, or have no real existence and only be a delusion in the patient's mind. Success in treatment depends on accuracy in diagnosis.

SPECIAL ARTICLES

PARIS

(FROM OUR OWN CORRESPONDENT)

MEDICAL ASPECTS OF THE MARSEILLES ASSASSINATIONS

THE gunshot wounds from which King Alexander died were evidently such as to prove rapidly fatal. But it seems that Louis Barthou's life might have been saved had he received skilled treatment in a reasonably short time. *Excelsior* bluntly says that if Barthou's injured arm had been ligatured at once he need not have died. Though the assassin's bullet had fractured a bone in the arm and wounded its main artery, Barthou was able himself to open the door of the motor-car in which he had been shot and to walk to the Bourse where he found a taxi, which took him to hospital. Here the interne at once put a ligature on the arm above the elbow, and, when surgeons arrived, Barthou was taken to the operating theatre and anæsthetised. The wound was cleaned and the fracture set. On beginning to recover consciousness, he was so weak that blood transfusion was undertaken, but death occurred at 5.45 P.M. *Excelsior* expresses amazement over the fact that it took 20 minutes to transport Barthou from the scene of the shooting (at 4.10 P.M.) to the hospital, and that, owing to the absence of any emergency ambulance service, yet another 20 minutes had to pass before he was given first aid. This absence of medical preparedness at Marseilles is commented on with much disgust in Paris where a municipal councillor, Mr. Armand Massard, has asked the Prefect of the Seine and the Prefect of Police if it would not be possible to assure the presence of a medical service at all official meetings at which persons of distinction are present.

WELL-TO-DO PATIENTS IN PUBLIC HOSPITALS

The well-to-do patient (whether out-patient or in-patient) in a public hospital raises one or other of two questions. If he pays nothing, he accepts services destined exclusively for the poor from whom he is in a sense stealing. And if he pays, little or much, he is impaling the public hospital on the horns of a forensic dilemma, for it is illegal for such an institution to develop any commercial activity. Pressure has been put on the hospital authorities to induce them to discourage the well-do-do in their patronage of the public hospitals in this sense; and the director-general of the *Assistance Publique de Paris* has recently addressed to the Parisian public hospitals a memorandum in which he points out that, thanks to the constant improvement in the public hospital services, well-to-do persons have taken advantage of them in spite of being able to employ private practitioners and clinics. Accordingly certain employees of the public hospitals must henceforth investigate the financial status of patients who may conceivably be well-to-do. Such persons will be asked to sign a statement and to produce documentary evidence of their eligibility to receive free treatment. There are, however, five groups of cases to remain exempt from the effects of these instructions. They are (1) urgent cases, duly certified as such by a doctor; (2) cases raising public health problems (venereal disease or tuberculosis); (3) street and occupational casualties; (4) the subjects of national health insurance; and (5) war pensioners. The public hospital which finds itself the embarrassed host of a patient who has secured admission to it by an elliptical approach is to notify the head of the *Assistance Publique* who will dispense the *sanctions convenables*.

INTRAVENOUS METHYLENE-BLUE IN LEPROSY

On Oct. 2nd a report was presented by Dr. Marchoux to the French Academy of Medicine on the treatment of leprosy on behalf of Dr. Montel, of Saïgon. Since November, 1933, he has given intravenous injections of methylene-blue to 172 patients suffering from leprosy. Every form of leprosy was included in this group. In early cases continuous improvement was observed, sleep and appetite returning and the ulcers healing. In cases of old standing, the rapid improve-

ment observed at the outset was followed by a stage of relative stagnation from which most of the patients had not yet emerged, although some degree of progress was still being made. Dr. Montel is of the opinion that no other treatment has hitherto been able to effect such rapid improvement; he finds the action of methylene-blue at least three times as rapid as that of chaulmoogra oil and its derivatives, over which it has the advantage of being effective in all forms of disease. But the best results would seem to be obtained by a combination of methylene-blue with chaulmoogra oil treatment. From the public health point of view it is interesting to note that open contagious forms of the disease can be rapidly changed into closed non-contagious forms by this treatment. Though its mode of action is still imperfectly understood, it seems that methylene-blue has an elective affinity for leprous tissues—a condition not without its inconveniences, for the blue colour of the leprous lesions is distressing to patients anxious to hide their condition. The selective discoloration, however, vanishes some six weeks after the last injection.

CANCER OF THE CERVIX

The anti-cancer centre of Marseilles, established in 1927, has functioned regularly since the beginning of 1928. Prof. Léon Imbert has recently [1] analysed the results of radiological treatment, according to Regaud's technique, given to 252 cases of cancer of the cervix during the years 1928–31. Of the 102 cases dating at least five years back, only 12 could be claimed as cures. It should however be noted that every patient coming to the centre was treated, and that 50 belonged to the fourth stage of the disease. There were indeed no patients in the first stage. Seven of the 17 patients in the second stage (41 per cent.) and five of the 35 patients in the third stage (14 per cent.) could be considered cured, as judged by the five-year test. There were no survivors among the 50 fourth-stage patients. Between 1928 and 1933 inclusive, the proportion of early cases, in the first and second stages of the disease, had risen from 11 to 48 per cent.—one of the most encouraging features of Prof. Imbert's report.

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

CATGUT AND TETANUS

IN Australia it has been the practice for most hospitals and many private surgeons to buy raw catgut and prepare it themselves, by the biniodide method. This method was used almost exclusively for many years; post-operative infection was uncommon and post-operative tetanus was rarely reported. The first suspicion that all was not well with this means of sterilisation, which for years appeared to have given satisfactory results, was the publication of the Medical Research Council's investigation by Bulloch, Lampitt, and Bushill. Even after this many surgeons maintained that the clinical results had been so uniformly good that they scarcely felt disposed to make a change. A series of deaths from post-operative tetanus has, however, necessitated further review of the situation, and the biniodide method has been almost generally replaced in New South Wales by the iodine method. Still there are a number of surgeons who strongly oppose this change claiming that there are many grave disadvantages in the use of iodine and that the case against catgut as a cause of tetanus, or against the biniodide method, is not proven.

The main disadvantages of the iodine method are said to be that it makes the gut slippery; that it seriously interferes with its physical properties, including its tensile strength; that it tends to prevent its absorption; and that the iodine in the tissues acts as an irritant, causing the formation of serum and infection in wounds. One of the main points emphasised in the method of preparation, as outlined in the Medical Research Council report, is that the glycerin makes the catgut so slippery that knots cannot be tied with safety and that ligatures and sutures are liable to come undone, thus causing reactionary hæmorrhage and post-operative hernia. There can be no doubt that as regards gut prepared in Australia by this method there is some substance in these objections.

The New South Wales Branch of the British Medical Association in a letter to the *Medical Journal of Australia* (August 4th, 1934, p. 172) gives a report by its section of surgery in which it is held to be proved, from the work of Bulloch, Cooper, Williams, and others, that spirituous biniodide is ineffective as a sterilising agent; the section believes that the method advocated by Bulloch, Lampitt, and Bushill and the modifications of it employed at the Royal Prince Alfred and the Sydney Hospitals and at the Royal Infirmary, Edinburgh (published in the *Edinburgh Medical Journal*, April, 1934, by T. J. Mackie), is safe. The modifications of the iodine method by the Sydney and Royal Prince Alfred Hospitals have been made with a view to the elimination of the disadvantages mentioned above. In both the modifications the iodine solution is the same as that recommended in the Medical Research Council report, except that at the Prince Alfred Hospital no glycerin is used in the solution, or at any stage of the sterilisation; further, after ten days in the iodine solution, the gut is placed in repeated changes of 1 in 250 biniodide in rectified spirit and then stored in this solution. In the Sydney Hospital method, 5 per cent. glycerin is used in the iodine solution instead of 10 per cent. as recommended in the Medical Research Council report; the gut is then placed in a decolorising solution of 85 per cent. alcohol and 5 per cent. glycerin, and after repeated changes of this solution it is stored in rectified spirit. The letter from the British Medical Association concludes with a full quotation of the Therapeutic Substances Act of Great Britain.

The editor of the *Medical Journal of Australia* devotes several pages to an instructive leading article on the subject, in which it is revealed that nine cases of post-operative tetanus have been investigated in New South Wales since 1930. These occurred at seven different hospitals; the same brand of catgut had been used in the first five cases, but in the whole series five different brands had been used. As has previously been noted, in every case the operation had been undertaken for the relief of an abdominal condition, and in seven of the nine the biniodide method of preparation had been used. In only one case was the tetanus bacillus recovered from the tissues. In this article reference is made to a paper shortly to be published in the October issued of the *Australian and New Zealand Journal of Surgery* by Dr. C. H. Kellaway and Miss F. Eleanor Williams, who isolated tetanus bacilli from catgut which had been used in operations followed by tetanus and found that on injection some of these organisms gave rise to tetanus in animals. They state that

[1] Presse méd., Oct. 10th, 1934, p. 1580.

though it is usual for the washed spores to fail to cause symptoms when injected into animals, cultures containing toxin generally give rise to experimental tetanus, and they suggest that the presence of a contaminating anaerobe may have caused destruction of toxin in their investigations and may have accounted for the low mortality among their laboratory animals. They suggest that this contamination may also contribute to the low post-operative incidence of tetanus in man despite the use for so many years of catgut prepared by methods inefficient for sterilisation.

The ways of the tetanus bacillus are indeed strange. The toxin adds a factor whose part is so difficult to determine that it seems that even if the catgut used in every surgical operation were made free from tetanus bacilli or spores, post-operative tetanus would probably not be entirely eliminated.

THE LONDON MEDICAL EXHIBITION

THIS exhibition opened in the Royal Horticultural Society's Hall on Oct. 15th, and will remain open until Friday, Oct. 19th. The number of stands was greater than ever, 167 in all, and the first day showed a record attendance. Exhibitors were very pleased, and any suggestion that the exhibition was moribund is now firmly discredited. For the first time it is open in the morning, from 11 A.M., thus affording an opportunity to those whose afternoons are occupied. Quite a number of new preparations and improved formulas were shown, and the old friends of the profession were well represented.

Drugs and Pharmaceutical Preparations

(90) ALLEN AND HANBURYS, LTD. (Bethnal Green, E.), had a wide range of preparations, notably Ferrodic, chocolate-flavoured ferrous phosphate containing 1·75 per cent. of iron (Fe) in the ferrous state; Hepol, sterilised solution of liver extract for parenteral injection, each c.cm. containing the anti-anæmic principles of 20 g. of fresh liver; Eugastrol, a desiccated gastric substance for pernicious anæmia; and Sclerosol S.M., a solution of sodium morrhuate for varicose veins which keeps and does not congeal at ordinary temperatures.—(61) THE ANGIER CHEMICAL CO., LTD. (86, Clerkenwell-road, E.C.), besides their familiar emulsion of petroleum and hypophosphites, presented Sagradol, a laxative compound of mineral oil and aromatised cascara sagrada, without any phenolphthalein or sugar.—(10) ANGLO-AMERICAN PHARMACEUTICAL CO., LTD. (59, Dingwall-road, Croydon), showed a range of preparations, notably Huxley's Surgical Powder, a zinc oleostearate associated with refined starch, boric acid, thymol, and methyl salicylate, for weeping surfaces, urticaria, intertrigos, and bedsores; Syr. Glycerphosph. Comp. Huxley, a well-tried tonic preparation without alcohol, saccharin, or sugar; Sal. Antisepticus Huxley, a granular powder for discharging mucous surfaces; and Dermafoam for cleaning the hands and keeping the skin supple.—(116) THE ANGLO-FRENCH DRUG CO., LTD. (11 and 12, Guilford-street, W.C.), showed their preparations, drawing special attention to Anaquintine in a drop-counting instillator for rhino-pharyngeal therapy; Gynoestryl, their pure crystalline ovarian follicular hormone in ampoules of 1 c.cm., representing 1000 I. units, for injection, and also in solution and tablets; Vagotonine, a hormone recently isolated from the pancreas which increases parasympathetic tone; and Orkitone, a palatable elixir of interstitial extract possessing tonic properties.—(7) ARMOUR AND COMPANY, LTD. (Armour House, St. Martin's-le-Grand, E.C.), among their many "Glanoid" glandular extracts, pointed out Panlittol tablets for high blood pressure, a compound of pancreas and thyroid; and their new standardised ovarian preparation, each dose containing 25 Allen-Doisy rat units.—(44) BAYER PRODUCTS, LTD. (Africa House, Kingsway, W.C.), had two new products to show: Devegan, an arsenical preparation for the treatment of leucorrhœa, put up in tablets to be inserted well into the vagina where they are entirely used up, and are said to reinstate the normal flora; the other was Bioferrin, a nutrient tonic based on hæmoglobin, iron, and liver extract; they also showed their range of well-known products, including Prominal, recently introduced for the treatment of epilepsy, having a less hypnotic action than luminal.—(35) JOHN BELL, HILLS AND LUCAS, LTD. (Oxford Works, Tower Bridge-road, S.E.), had a range of medicinal specialties including Danium ointment, prepared from titanium salts and recommended for eczema and other chronic skin infections; Ephedrin Nasal Solution; halibut oil and malt with colloidal iron, and a range of colloidal lotions.—(5) BENGUE AND CO., LTD. (24, Fitzroy-street, W. 1), had many of their familiar products on view, and pointed out a new preparation of ovarian hormone and thyroxin, each dose equivalent to 2½ mouse units: Basedovyl; also Arhemapectyl, a blood coagulant, soluble pectin combined with colloidal calcium, for the prevention and control of hæmorrhage; Anaclasine, an anti-anaphylactic for oral use; Opocalcium, a mixture of the principal mineral salts and endocrine extracts for various conditions of debility and tuberculosis; and Passiorine, a fluid extract of passiflora extract of *Salix alba* and alcoholic tincture of *Crataegus oxyacantha*, which acts as a circulatory and nerve sedative.—(87) BISODOL, LTD., and ANADIN, LTD. (12, Chenies-street, W.C.), showed their well-known anti-acid digestant and sedative.

(37) BOOTS PURE DRUG CO., LTD. (Nottingham), had their extensive range of preparations, and particularly emphasised Livron, a compound liver extract with iron, yeast, and malt; Hepastab, a concentrated sterile solution of the anti-anæmic factor of mammalian liver prepared for intramuscular injection and tested clinically before issue. They have reissued their Pepsac desiccated stomach substance in a de-fatted form which is much easier to take than the original preparation.—(140) BRITISH DRUG HOUSES, LTD. (Graham-street, City-road, N.), in addition to their vitamin preparations—Radiostol (D), Radiostoleum (A and D), and Radio-Malt (A, B, and D)—showed a new vitamin C preparation; Glycine B.D.H. (amino-acetic acid), for progressive muscular dystrophy; Tannaflavine, a powder which when made up with water yields a 20 per cent. solution of tannic acid, with 1/1000 acriflavine; and their crystalline follicular hormone Œstroform, exhibited as an oily solution and in tablet form, possessing respectively 1,000 and 10,000 international units of activity per c.cm. and 1000 units per tablet.—(114) BURROUGHS, WELLCOME AND CO. (Snow-hill Buildings, E.C.), displayed among their products Wellcome Brand insulin; Tannafax non-oily, non-greasy jelly for the treatment of burns by tannic acid; a range of serological and photographic products and medicine chests and cases; vitamin products, including Kepler brand cod-liver oil and malt, and vitamin D as tabloid Calciferol, and also Ergotoxine Ethanesulphonate in tabloids, hypodermic tabloids and as Ernutin.

(1) G. W. CARNRICK CO. (Brooks and Warburton, Ltd., 232, Vauxhall Bridge-road, S.W.), in addition to Hormotone, had on show Incretone, their liquid endocrine tonic, and Thelestrin, a standardised follicular hormone supplied in ampoules containing 25 to 50 Allen-Doisy rat units for hypodermic administration.—(165) THOS. CHRISTY AND CO., LTD. (4/12, Old Swan-lane, E.C.), distributors of Glyco-Thymoline, showed Gorun ampoules and cachets for sciatica, lumbago, and many forms of arthritis; Ergoapiol (Smith), indicated in the treatment of amenorrhœa, dysmenorrhœa, and other menstrual disorders; Musterole brand magnesia oil; Sorbefacin antiseptic, antiphlogistic, and nutrient dress-

ing, for the treatment of all inflammatory conditions; Tussipect, an expectorant made from primula root and containing its ammonium salt as the active principle; and Pandigal, a stable preparation of *Digitalis lanata*, which is practically non-cumulative in action.—(13, 14) COATES AND COOPER, LTD. (94, Clerkenwell-road, E.C. 1), representing TEMMLER CHEMICAL WORKS, Berlin; N/V DISPERT, Holland; THE BATTLE CREEK FOOD CO., Michigan, U.S.A.; A/S SERPENS, Copenhagen; THE BIO-CHEMICAL LABORATORIES, LTD., Locarno; GOMENOL LABORATORIES, Paris; DESITIN WORKS; AMERICAN APOTHECARIES CO.; CHEMICAL WORKS H. MACK, NACHF., particularly pointed out their new products Forapin, bee-venom salve for the treatment of rheumatic diseases and allied conditions; Sciatago, a treatment for rheumatic diseases based on the idea that they owe their origin to a deranged metabolism; the Dispert preparations containing the active principle of the products concerned prepared by a special desiccation process; Disulphamin for infectious diseases; and Desitin ointment, a stable cod-liver oil unguent for wounds and burns.—(3) CONTINENTAL LABORATORIES, LTD. (30, Marsham-street, S.W.1), besides their well-known Taxol, showed Antipeol, a vaccine filtrate containing the antivirus corresponding to staphylococcus, streptococcus, and pyocyaneus, for arresting microbic infection in wounds; and Crinex, a non-albuminous total ovarian extract for oral administration.—(117, 118, 138) CROOKES' COLLOSOLS (Park Royal, N.W. 10) emphasised again the value of their halibut oil as 30 per cent. stronger than any other on the market and entirely British, and introduced Halycitrol, each tablespoonful of which contains the equivalent of a teaspoonful of cod-liver oil, a teaspoonful of fresh orange juice, and also glucose. Another new preparation is Lacto-Kaolin, wherein the constipating effect of the kaolin is neutralised by lactose; and mercuric sulphide, a truly colloidal preparation, for intramuscular or intravenous treatment of venereal conditions. They also showed Ferrofax, an iron, yeast, copper, manganese and cobalt preparation, and noted that their Dekrysil is now in Part I. of the Poison Schedule. This firm is also introducing the new Colloseal cap for elegant dispensing—an attachment to a medicine bottle which gives an even pour and no runback.

(97) J. C. ENO, LTD. (Pomeroy-street, S.E.), showed their popular fruit salt.—(149, 150, 160) EVANS, SONS, LESCHER AND WEBB, LTD. (56, Hanover-street, Liverpool), had a large display of chemicals and preparations, and pointed out Carditone, a watery solution of 15 per cent. sodium camphosulphonate, which can be administered intravenously as well as by the mouth; Eubion, a vitamin A concentrate made up in chocolate-covered tablets each equivalent to a tablespoonful of cod-liver oil; and common cold vaccines prepared from local strains, as the firm finds that colds vary somewhat from district to district, although the precise difference cannot be labelled.—(70) FASSETT AND JOHNSON, LTD. (86, Clerkenwell-road, E.C.), pointed out on their stand Ovoferrin, a fluid iron colloid which has a general tonic and stomachic action; Lingford's Liver Salt, a saline aperient containing calcium iodide; and Argyrol brand Silver Vitellin, which has a sedative and inflammation-allaying action.—(11) GENATOSAN, LTD. (Loughborough), showed their popular products, and ordinary and local immunity vaccines, drawing special attention to Calcium aspirin (Coplans) which is claimed to have the advantages of aspirin without its disadvantages. They will shortly be introducing the Fissan Idea, an improved method of preparing medicaments for cutaneous application.—(95, 96, 109) GLAXO LABORATORIES (56, Osnaburgh-street, N.W.) drew attention to Syrup Minadex, a modern adaptation of Syrup Ferri Phosphatis Co. and cod-liver oil, combining their active principles with "trace" metals; and Adexolin liquid and capsules, a preparation of vitamins A and D, each capsule being equivalent to 10 g. of cod-liver oil.—(121) C. J. HEWLETT AND SON, LTD. (35/42, Charlotte-street, E.C.), among their many pharmaceutical preparations, selected for mention two new tablets: Tablets pro Adiposis and Tablets co Cerevisæ; their antiseptic cream; their Gargarisma Formalin Co. mouth wash and gargle; Hepatagen aperient and cholagogue, and Hormonigen, a pluriglandular tablet.—(86) HOUGH, HOSEASON AND CO., LTD. (2, Bridge-street, Manchester), had a wide range of mixtures, and pointed out especially Tablets Arthritone, for rheumatic conditions; Tablets Chelidon Co., a cholagogue and urinary antiseptic; Tablets Lignaseptone, introducing carbonised Sphagmoss, colloidal iodine and alumina as an intestinal antiseptic and depurefacting agent; and Nalgo, an antiseptic and analgesic.—(71) HOFFMAN-LA ROCHE CHEMICAL WORKS, LTD. (51, Bowes-road, N.), in addition to their well-known range of analgesics, sedatives and hypnotics, drew attention to Imadyl, a treatment for rheumatism by histamine; Revitone, their stimulating, non-constipating general tonic; Saridone, a combination of analgesics and antipyretics for the relief of painful conditions; and also two new preparations: Redoxin, a synthetic vitamin C, and Larostidin, a preparation for the treatment of peptic ulcer by injection.—(45) HOWARDS AND SONS, LTD. (Ilford), showed their medicaments and preparations, notably Quinisan, the new quinine salt which is said to have an extremely rapid action in colds and influenza; Agotan, a preparation for uric acid conditions, corresponding to the B.P. cinchophen, and the Standard Ether for anæsthesia which is now made from duty-paid pure rectified spirit at the same price as was formerly charged for ether made from methylated spirit.—(63) JOHNSON AND SONS (Hendon, N.W.) showed their silver and egg yolk preparation Arvitin, which is standardised to contain 20 per cent. of metallic silver in colloidal form; and their Estersil, a mixture of ethyl and propyl esters of salicyl glycollic acid, recommended for rheumatic affections.—(166) KAYLENE, LTD. (Waterloo-road, N.W.), demonstrated their well-known product and its modifications, notably Carbokaylene, a preparation combining the detoxicating action of Kaylene with the flatulence-reducing properties of vegetable charcoal; and Kaylene saline, an effervescing digestive mixture.

(139) LEVER BROS., LTD. (Port Sunlight), showed two vitamin products, Essogen, containing vitamin A biologically standardised and free from vitamin D, with a blue value of 2000, packed in 2 m. capsules; and Advita, vitamins A and D together, also biologically standardised and packed in 2 m. capsules, balanced at 1250 blue value for A and 1000 units per g. for D.—(122) WM. MARTINDALE (12, New Cavendish-street, W.) had a wide range of preparations on display, especially ether-soluble tar paste for eczema and other skin affections, containing a special fraction of distilled coal tar, zinc oxide and starch; Methyl Aspriodone liniment and balm for rheumatic pain; and peptone sterules.—(99) MAY AND BAKER, LTD. (Dagenham, London), amidst their numerous preparations drew attention to Sonalgin, which is an extension of the action of Soneryl, having in addition amidopyrin, and is a strong analgesic and hypnotic; Myocrisin, a gold preparation for the intramuscular treatment of arthritis and tuberculosis; Aplexil, a vaccine for influenza; and Urazine, a combination of piperazine, citric acid and salicylic acid, for rheumatic conditions.—(148) MENLEY AND JAMES, LTD. (64, Hatton-garden, E.C.), together with their familiar Iodex and Neuro Phosphates (Eskay Brand), had on show Pentnucleotide, a mixture of the sodium salts of pentose nucleotides, for agranulocytic angina, and also when leucopenia occurs in infections which are usually accompanied by leucocytosis; and Pyridium, their urinary antiseptic which acts in either an acid or an alkaline medium.—(103) H. R. NAPP, LTD. (3 and 4, Clement's Inn, W.C.), picked out from their range of preparations Hepamult, a preparation which gives the effect

of 8 oz. of fresh liver at a cost of 6d., and Oleo-Sanocrysin, an intramuscular preparation produced to meet the demand for a gold product in cases where intravenous injection is difficult or impossible.—(120) OPPENHEIMER, SON AND CO., LTD. (Handforth Laboratories, Clapham-road, S.W.), among their various preparations, pointed out Alphidine, a non-toxic, non-irritant form of iodine which is readily assimilated; Alphidine combined with guaiacol in palatinoid form for rheumatism and arthritis; Maglactis, a very fine permanent suspension of magnesium hydrate; and Roboleine, their reconstructive tonic food. They also demonstrated their aeriser, which reduces all oily liquids to almost invisible smoke.—(73) OXO, LTD. (Thames House, Queen-street-place, E.C.), showed their numerous glandular preparations, notably Liveroid, a special liver juice for anæmia, and the Oxoid liver extract for injection when immediate response is required.—(64) PARKE, DAVIS AND CO. (W.), on a stand filled with various drug preparations, pointed out their alum precipitated diphtheria toxoid, the effectiveness of which lies in the fact that the antigen is absorbed only very gradually so that the immunising properties are manifested over a long period; Hebaral sodium, a barbiturate producing refreshing sleep with a wide margin of safety between therapeutic and toxic doses; liquid Mycosal for myotic infections of the skin, and Irradex, a preparation of manganese, iron, and vitamins A, B, and D in a palatable and diastasically active malt vehicle.—(75) PETROLAGAR LABORATORIES, LTD. (Braydon-road, N.), besides their well-known emulsion of mineral oil, and Neo-bovinine tonic food, had a display of Endrine, their nasal compound for colds and hay-fever; and Proctoids, a new hæmorrhoidal suppository which combines the qualities of zinc oxide and boric acid in a convenient torpedo shape.—(155) REED AND CARNRICK (CANADA), LTD. (Distributors: Coates and Cooper, Ltd., 94, Clerkenwell-road, E.C.), had on view a wide range of single and multiple gland products, notably Pancrobilin, a compound of bile and pancreas for the treatment of constipation; and Tonicine, a male or female gonadal tonic combined with strychnine and glycerophosphates.—(58) RESEARCH PRODUCTS, LTD. (12/13, Henrietta-street, W.C.), in addition to hormone and vitamin preparations, showed a range of medicinal products for external application embodying the new lodynic principle of surface tension and capillary activity—e.g., Jelopar nasal jelly, Lodynic nasal spray and douche, and Gonopar silver jelly.

(147) SANDOZ PRODUCTS (134, Wigmore-street, W.) had their familiar range of products, and especially pointed out Calcium-Sandoz syrup, containing 60 gr. of Calcium Sandoz to the tablespoon, in a form free from all hexoses. Their newest product was Digilanid, a preparation of digitalis which, they claim, has great advantages over all previous forms.—(27, 28) SAVORY AND MOORE, LTD. (143, New Bond-street, W.), among their many medicinal preparations, drew special attention to Medilax, a vegetable mixture for constipation made up as silver-coated ovoids; Nembutal (Abbot) a hypnotic for use when short hypnotic and long sedative action is desired; and the Fructoles series of preparations, offering many valuable medicaments in perfect solution and palatable form.—(47) SCHERING, LTD. (188-192, High Holborn, W.C.), pointed out the latest preparation of Progynon: Progynon B. Oleosum available in the form of dragées and also intramuscular injections in concentrates of 10,000 and 50,000 mouse units; Solganal B. Oleosum for intramuscular injection; Neotropin, a bactericide, urinary antiseptic, and general internal disinfectant by the oral route; and to their well-known products, including their analgesic and hypnotic Veramon and Medinal.—(25) SCOTT AND BOWNE, LTD. (10, Stonecutter-street, E.C.), makers of the well-known Scott's Emulsion of cod-liver oil, introduced Halivite, the latest preparation of halibut liver oil, and particularly drew attention to their patent pill, a cheerful yellow spherule containing two drops of the oil, biologically standardised to exhibit a vitamin A and D potency approximating to the natural balance found in cod-liver oil.—(164) SHARP AND DOHME, LTD. (252, Regent-street, W.), showed their Solution S.T. 37, a stable non-irritating germicide prepared as a solution, pastilles, and paste: their tonic and sedative preparations, Glycero-phosphates Comp., and Somnos Mulford, and their serobacterins, a sensitised vaccine containing the antibody-antigen combination, for treatment and prophylaxis; also alum-precipitated diphtheria toxoid (Mulford), the single dose treatment for diphtheria prophylaxis.—(153) TONICITY LABORATORIES, LTD. (26, Great Ormond-street, W.C.), demonstrated their Halmagon tablets, which contain the halogen compounds of magnesium, and are suggested for conditions of magnesium deficiency, lowered vitality, prostatic enlargement and many others.—(33, 34) WILLIAM R. WARNER AND CO., LTD. (300, Gray's Inn-road, W.C.), showed their familiar range of products, including Agarol, an emulsion of mineral oil with phenolphthalein, glycerine and agar-agar; Anusol hæmorrhoidal suppositories; and particularly stressed their Veganin analgesic and sedative tablets containing aspirin, phenacetin, and codeine, and recommended for painful conditions, fever, and influenza.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Vice-Adml. Robert W. B. Hall, C.B., O.B.E., on Oct. 3rd was received by the King upon his appointment as Medical Director-General of the Navy. He was granted the rank of Surg. Vice-Admiral on July 2nd last, when he took up his duties as Director-General.

Surg. Comdrs. R. E. Rampling to *Delhi* on recommg. and as Squadron M.O. (on transfer of flag), and J. A. Maxwell to *Pembroke*, for R.N. Hospl., Chatham, temp.

Surg. Lt.-Comdr. M. Barton to *Pembroke*, for R.N. Hospl., Chatham, temp.

Surg. Lts. B. S. Lewis to *Alecto*, and J. M. McNamara to *Duncan*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Sub-Lt. C. M. Lamont promoted to Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Lt. (on prob.) A. J. Clyne is confirmed in his rank.

Short Serv. Comms.—Lt. (on prob.) M. J. Horgan resigns his commn.

The undermentioned Lts. (on prob.) are confirmed in their rank, in the following order of seniority: R. H. Foster, A. G. D. Whyte, J. Boyle, A. L. Pennefather, J. S. Ruddell, F. E. Buckland, D. T. Swift, R. A. Stephens, J. H. J. Crosse, E. H. P. Lassen, I. Buchanan, and W. T. Bermingham.

TERRITORIAL ARMY

Capt. J. W. Hirst to be Maj., with seniority next below Maj. A. H. Macklin, O.B.E., M.C.

Capts. A. Swindale and D. L. Kerr to be Majs.

Capt. & Bt. Maj. O. G. Misquith to be Maj.

Lts. J. W. Lobban, B. G. Macgraith, and G. E. O'Riordan to be Capts.

Lt. A. W. Marsden to be Capt. with seniority next below Capt. J. R. Robertson.

ROYAL AIR FORCE

Squadron Leader T. V. O'Brien to Marine Aircraft Experimental Establishment, Felixstowe, for duty as medical officer.

Squadron Leader W. F. Wilson, M.C., to No. 2 Flying Training School, Digby, for duty as Medical Officer.

Squadron Leader H. McW. Daniel to Station Headquarters, Hendon, for duty as Medical Officer.

Flight Lt. J. Magner to Station Headquarters, Netheravon.

Flying Offr. L. S. Everett is promoted to the rank of Flight Lt.

CORRESPONDENCE

L'UNION INTERNATIONALE CONTRE LE CANCER

To the Editor of THE LANCET

SIR,—Many of your readers will be aware that a preparatory conference took place in Paris last March which had for its purpose the formation of an international union, whose main objects will be to establish close liaison between organisations concerned in the study of cancer; to combat charlatanism; to propose criteria for a uniform system of international records; to publish occasional bulletins on matters of international importance; and to organise future international congresses. The preparatory conference, which was convened by Mr. Justin Godart, former Minister of Health and president of the last International Cancer Congress in Madrid in 1933, was extremely well attended. No less than 32 countries (20 European and 12 extra-European) were represented by one or more delegates. The British delegation consisted of Lieut.-Colonel A. B. Smallman from the Ministry of Health; Mr. Richard Davis from the British Empire Cancer Campaign; Dr. W. Cramer from the Imperial Cancer Research Fund; Mr. Sampson Handley from the Middlesex Hospital; and Mr. Cecil Rowntree from the Cancer Hospital.

Agreement was reached upon certain general questions of principle, and statutes controlling the organisation of the union were adopted. Of these, the ones relevant to the present purpose are:—

1. That each country shall be represented by two delegates, who will collectively constitute the governing body (*conseil de direction*) which will meet annually so far as possible in a different country each time.

2. That the *conseil de direction* shall have power to add to its numbers up to one-third of its total membership, by election of associate members from any country.

3. That each country shall be asked to arrange for the nomination of these national delegates.

A temporary executive committee was appointed, consisting of: *France*, Mr. Justin Godart (president); *Germany*, Prof. Max Borst; *Belgium*, Prof. J. Maisin; *Italy*, Prof. A. Lustig; *Spain*, Prof. del Rio Hortega; *United States*, Dr. Carter Wood; and *Great Britain*, Mr. Cecil Rowntree. They are to conduct any necessary business until such time as the *conseil de direction* is in being. This temporary committee met in Paris in July, and provisionally arranged that the annual subscription of governments or cancer organisations desiring to join the Union Internationale shall be 1000 French francs.

Arrangements have been made for the preliminary work in connexion with the selection of British representatives for the *conseil de direction* to be undertaken by the British delegates to the preparatory conference held last March, and the object of this letter is to ask those organisations in Great Britain which were not represented at the preparatory conference, but which will no doubt desire to join the Union, to communicate with me or with one of my fellow delegates, so that a meeting may be called for the purpose of electing the two British representatives.

I should add that the Ministry of Health and the Department of Health for Scotland are sympathetic towards the objects of the proposed Union.

I am, Sir, yours faithfully,

CECIL ROWNTREE.

9, Upper Brook-street, London, W.1, Oct. 15th.

TREATMENT OF RHEUMATOID ARTHRITIS WITH GOLD SALTS

To the Editor of THE LANCET

SIR,—Apropos of Dr. Forestier's article in your issue of Sept. 22nd, I beg to submit observations on two patients with rheumatoid arthritis treated with gold injections, under the care of Dr. Vincent Coates in the wards of the Royal Mineral Water Hospital, Bath. I regret that the circumstances under which these two cases were treated did not permit of a larger series. The conditions considered desirable were as follows:—

1. That each patient should already have been under observation in hospital with appropriate education for three months prior to gold injections. This was thought to be essential seeing that every patient admitted to the wards of the hospital, with the possible exception of the hopelessly crippled, benefits considerably as a result of a correct régime, no matter what accessory treatment be given. Three months was the period chosen as sufficient to allow of stabilisation of metabolism and for education in the matter of joint régime.

2. During the period of gold injections no treatment other than this was allowed; no massage or baths were given nor were drugs of any sort, except aperients. The two patients were put under conditions which necessitated rest in bed for 18 out of the 24 hours and neither was allowed to walk, because of synovial enlargement of the weight-bearing joints; but a full movement (without strain) of every joint was carried out daily. The diet was the ordinary hospital diet.

3. That the circumstances relating to the particular cases selected warranted submission to treatment of uncertain efficiency.

Allochrysine was the gold salt selected, so that its effects might be compared with those of Forestier, whose statement, however, in respect of accessory treatment should be quoted: "We do not consider that gold salts treatment should be given without the other treatments for arthritis, especially massage with active and passive movements; all kinds of physiotherapy prove of great value as an aid to the method. Hydrotherapeutic treatment—sulphur baths, douche massage, mud baths—has been used by 60 per cent. of our patients and has certainly helped to bring about a rapid improvement of the functions" (THE LANCET, 1932, i., 444). The following are brief particulars of the cases:—

CASE 1.—Female, aged 24. Onset of rheumatoid arthritis, October, 1930, with involvement of all joints of extremities by Christmas of that year. Standard treatment of the general condition as well as orthopædic measures resulted in a marked improvement and though at the beginning of gold treatment movement of all joints was full with the exception of slight limitation of the right shoulder-joint and some weakness of grip, a mild degree of fusiform swelling persisted.

CASE 2.—Female, aged 23. Onset of rheumatoid arthritis, Christmas, 1931. At the beginning of gold treatment both wrists were slightly fusiform with marked limitation of movement. The knees were mildly affected and the ankles somewhat swollen with limitation of movement of the left ankle. There was limited movement of the jaw also.

In addition to a careful clinical examination, including inspection of the mouth for latent sepsis, a urea-concentration test was carried out on both patients to ensure that renal function was normal. A suspension stability test of the erythrocytes was performed and radiograms were taken of morbid articulations. Each patient had three injections

of 5 cg. allochrysine at intervals of five days; then weekly injections of 10 cg., the whole course extending over three months. The results may be summarised:

CASE 1.—Clinically the patient declared herself to be better, but the degree of improvement could not be assessed by ordinary clinical methods. The sedimentation-rate, however, was definitely improved, the reading at the end of one hour being 50 per cent. instead of 45 per cent. Radiographically no change was discerned in the articulations.

CASE 2.—Clinically there was improvement in the movement of the left ankle and the jaw and also an improvement in the grip but no other demonstrable change was present. The sedimentation-rate showed exactly the same readings as before treatment and radiographically there was no visible change.

It has been suggested that examination after an interval of two years might be required to show the time value of gold injections. To concur in this the necessity of periodic review and abstinence from accessory treatment should be stipulated. It might also be argued that contemporaneous observation of control cases of rheumatoid arthritis under the same conditions, treated by, say, injections of normal saline, would have further enhanced the value of conclusions reached. To this criticism it must be answered that improvement, if any, assignable to gold treatment was conspicuous by its absence. Under almost ideal conditions of rest and hygiene, treatment of the two patients by injections of the gold salt allochrysine not only failed to produce dramatic betterment but any improvement at all other than that which could be ascribed to a rest cure.

I am, Sir, yours faithfully,

LEO DELICATI,
Resident Medical Officer.
Sept. 26th. Royal Mineral Water Hospital, Bath.

THE UBIQUITOUS COLD

To the Editor of THE LANCET

SIR,—It is to be hoped that Mr. Macleod Yearsley's letter will not go unnoticed by the Ministry of Health. The time is long overdue that children with acute colds should be excluded from primary schools by masters and mistresses. The acute cold and catarrhal state is almost certainly the soil which breeds the rheumatic heart disease of the poorer classes—a disease almost confined to those who have attended primary schools. Is it not time that the school attendance officer was regarded as one of the causes of rheumatic heart disease?

I am, Sir, yours faithfully,

J. C. G. DICKINSON.
Braunton, N. Devon, Oct. 14th.

DIATHERMY IN CANCER

To the Editor of THE LANCET

SIR,—I have read with interest your leading article of Oct. 6th on diathermy in cancer, prompted by the work of Mr. Norman Patterson published in your columns. This appraisement of Mr. Patterson's work is of peculiar satisfaction to me, since his early writings on the subject first introduced me to this method of therapy in dealing with cancer of the mouth and pharynx, and have placed me eternally in his debt.

The one point with which I find myself in disagreement is the opinion expressed in your article that Mr. Patterson might have "gone further and asserted his doubts whether the use of cold steel can now be justified." I feel pretty certain that Mr. Patterson still agrees with me that there are definite indications for the use of cold steel. The results of laryngofissure and of laryngectomy by means of cold steel would seem to confirm this statement, and the end-results of the treatment of certain forms of carcinoma of the hypopharynx do not demand the abandonment of the use of the scalpel, at any rate in all stages of the operation. Dissections of the neck (with which Mr. Patterson has dealt in a special section), to those whose anatomical instincts die hard, still seem to be most safe and most drastic when carefully performed with cold steel, and every surgeon with experience of this class of work must have cases of his own where prolonged survival has followed operation on the neck performed with cold steel, when the lymphatic glands—even many lymphatic glands—have been microscopically (nay, macroscopically) secondarily infected with malignant disease.

I am, Sir, yours faithfully,

London, Oct. 10th. G. GORDON-TAYLOR.

THE UREA-CLEARANCE TEST

To the Editor of THE LANCET

SIR,—Dr. Hinden rightly emphasises the convenience of this test in providing an automatic valuation of known defective kidneys. The graphic method which Mr. Stewart and I suggested was designed for a rather different purpose—viz., to explore the region between normal and subnormal function. One drawback of efficiency tests is that a definitely "bad mark" generally means irreparable damage to the kidneys and cold comfort to the patient, whereas the correct way of tackling the problem of kidney degeneration would be to act on the earliest signals of distress. If the heart offers any analogy, functional overstrain will usually precede chronic functional incapacity, and we gave reasons for believing that strained kidney function is manifested by changes in the volume: concentration curve, the concentration varying proportionately less than it would normally do in response to variations of the secretion-rate.

I am, Sir, yours faithfully,

Wellington, Salop, Oct. 14th. A. R. MCCLURE.

PROPHYLAXIS AND ANAPHYLAXIS

To the Editor of THE LANCET

SIR,—I have read with interest the article in your last issue on Prophylaxis and Anaphylaxis. In view of a recent experience of mine I feel that the tone of your leader is too optimistic, and that the risk of serum anaphylaxis is probably greater than hitherto we have imagined. The facts are as follows: In conferring a temporary passive immunity on a group of boys at a school where there had been a serious outbreak of scarlet fever I had the unfortunate experience of anaphylactic shock with fatal results in one case. Five cubic centimetres of anti-scarlet fever serum was given intramuscularly. Within a minute or two sickness and vomiting occurred. The boy rapidly became collapsed and pulseless, with lips, tongue, and face markedly swollen. One cubic centimetre of adrenaline solution (1 in 1000) was injected deep into chest wall well within five minutes of the serum injection, followed shortly by another cubic centimetre. Artificial respiration was carried out, but the œdema of mouth and air-passages was so great that little progress was made. There were never any signs of recovery.

This boy was aged 14 years, well developed and healthy. There was no history of asthma, and no serum had been given previously, except the small amount contained in the three prophylactic doses of T.A.F. given two years before. This of course may

have been sufficient to sensitise him, but it is doubtful. In view of my experience I cannot subscribe to your statement that the risk of anaphylactic shock apart from asthmatics is infinitesimal if the serum is given by any route other than intravenous.

I am, Sir, yours faithfully,

Harrogate, Oct. 13th. SINCLAIR MILLER.

DISLOCATION OF THE JAW: BEWARE

To the Editor of THE LANCET

SIR,—I have read with much interest Mr. R. Kennon's instructive article on the Borderline of Dental Surgery in your issue of Oct. 6th (p. 751). The last paragraph of his paper deals with the dislocation of the jaw and its reduction. Mr. Kennon's method is a good one, though differing somewhat from that known to me with doctor and patient facing each other, the patient usually sitting. Yet it ought, I think, to be emphasised that the operator's thumbs ought to be protected, for sometimes with the reduction the jaw "snaps in" with a jerk, and the operator's thumbs get hurt. I remember very well, when I was a student at the medical faculty, the professor saying: "Gentlemen, mind your thumbs, for as soon as the patient gets relieved of the dislocation he wants to say 'thank you'—and bites you."

I am, Sir, yours faithfully,

V. SUK.

Masaryk University, Anthropological Institute, Czechoslovakia, Oct. 12th.

"RADIUM AND CANCER"

To the Editor of THE LANCET

SIR,—In an exceedingly kind review (p. 813) of my book, your reviewer points out that I have omitted all reference to statistics. May I assure him that this was done deliberately, as it was evident that any adequate consideration of statistics would involve a description of individual cases, and would extend the book far beyond the limits at my disposal. I hope that some day a volume on the clinical results of radium treatment may repair the defect.

I am, Sir, yours faithfully,

Harley-street, W., Oct. 12th. H. S. SOUTTAR.

OBITUARY

HENRY WENTWORTH WINDSOR-AUBREY, M.R.C.S., L.R.C.P.

THE death occurred on Sept. 24th of Dr. Windsor-Aubrey, who had for many years filled the post of medical officer to the firm of Messrs. W. D. and H. O. Wills at Bristol. He was the son of the Rev. H. G. Windsor-Aubrey, of Hale, near Salisbury, and received his medical education in Edinburgh and Bristol. He qualified as M.R.C.S. Eng., L.R.C.P. Edin., and retiring from general practice joined the firm of Messrs. Wills in 1894, this being one of the earliest medical appointments made by a firm in the interests of their employees. Before the passing of the National Insurance Acts and the formation of the panel the charge of the staff of a commercial business fell entirely to the firm's medical officer, and Dr. Windsor-Aubrey examined the employees at the time of their engagement, gave them domiciliary attention when necessary, and did the accompanying dispensing. He also advised the management of the firm when questions of hygiene, infection, and so on arose requiring medical knowledge, and speaking generally the responsibilities were far-reaching.

Dr. Windsor-Aubrey joined the army in 1916 and saw service at home and abroad for the next two years. In Malta he superintended a prisoners' camp containing over 3000 prisoners, and had medical charge of Fort Ricasoli, the garrison fort, and other stations round the coast. Towards the close of hostilities he was attached to numerous medical boards at home before returning to his old appointment. For 11 further years he was responsible for the health condition of the Bristol factory, and when he retired in 1929 with a well-deserved pension, his loss was regretted by all with whom his work had brought him into contact. He was an accomplished man, wrote verses, composed music, and was a good amateur artist. He died at the place of his birth.

SAMUEL HENRY NAZEBY HARRINGTON, M.R.C.S.

THE death was announced in THE LANCET last week of Dr. S. H. N. Harrington, a well-known medical practitioner in Birkenhead. Dr. Harrington received his medical education in Liverpool and qualified as L.R.C.P.I. and L.M. in 1885, taking the diploma of M.R.C.S. two years later. He practised for many years in Birkenhead and was well known both as a doctor and as a public worker. Elected sometime ago as physician to the Birkenhead Borough Hospital, at the time of his death he was honorary consultant officer. He had been medical officer at the Post Office and a local referee under the Workmen's Compensation Act. He had been a magistrate of the borough for many years. Dr. Harrington, apart from his professional work, took a large and intimate share in public movements of the city. He served on the town council and had been at times a member of the Libraries, Arts and Museums Committee of the city; he was in fact deeply interested in the promotion of the study of art and literature.

THE LATE DR. R. J. GITTINS

SUPPLEMENTING the brief notice in our last issue, Prof. L. G. Parsons writes: "Robert Gittins was one of a group of brilliant young pædiatricians which during recent years has been associated with the Children's Hospital at Birmingham. Both he and his wife were students at the Birmingham medical school and during five years of missionary work in India he came to realise the importance of pathological research and his own inability to carry it out satisfactorily. On his return to England Gittins devoted himself to the study of the pathological aspects of pædiatrics and was appointed pathologist to the Children's Hospital in 1930. He carried out all the pathological work in the series of studies of anæmia which recently appeared in the *Archives of Diseases in Childhood*, and was solely responsible for the work on leukæmia which has everywhere been regarded as a notable contribution to the cytology of the leucocyte. This work is marked by careful and accurate observations and an attention to detail which was typical of the man, his whole life being dominated by an ardent desire for truth. This whole-heartedness brought him the affection of all who knew him well. He was prepared to argue on either side on many controversial subjects, although tenacious even to a degree of obstinacy where principles were concerned. Nowhere did this character show itself better than in his championship of those in less favoured circumstances than himself, and it is not to be wondered at that his laboratory assistants would do anything for

him. His last public appearance was in one of the series of post-graduate demonstrations at the commencement of the new session when he spoke on pulmonary tuberculosis as a foe of little children. He felt strongly, even passionately, that the medical profession as a whole did not realise the deadliness of tuberculosis in childhood and took every opportunity of trying to enforce this view."

PANEL AND CONTRACT PRACTICE

The Care of Dependants

THERE is still much discussion about the best way of extending the benefits now obtained by insured persons to others who are not insured. The chief feature of the B.M.A. scheme of 1930 was that the dependants of those at present insured should obtain similar benefits to those enjoyed by the insured. No capitation fee was mentioned, but the system was to be the same except for the elimination of insurance committees whose functions were to be taken over by the public health committees of county and borough councils. This scheme would have extended medical benefit to about 88 per cent. of the population; it was criticised chiefly on the ground of cost and of the difficulty which would be sure to arise in defining the dependants, an insured person being almost always a worker. Thrift was, as now, to be encouraged by compulsory contribution to the cost—the State, the employer, and the employee all paying something, but the proportion was not then settled.

The scheme submitted to the recent Southport conference of the Labour Party [1] is for a non-contributory service available to everybody, staffed (eventually) by whole-time salaried officers working (in towns of any size) in central surgeries where patients would go for consultation instead of (as at present) to those of the doctor of choice. These central surgeries or clinics would have all necessary apparatus for examination and diagnosis, including specialist work, and for such treatment as could be given without recourse to hospital. These clinics would feed the hospital beds and be worked in conjunction with the staff of such hospitals. They would replace the system of referees now worked by the regional medical staff under the Ministry of Health, the assumption being that certificates for sickness benefit—roughly equivalent in money to unemployment benefit—under the supervision of experts available under all conditions, would be so good that independent second opinions would not be required. Under this scheme specialist services would be available without charge to any body asking for them. In this scheme insurance practitioners are to be asked to join at first as part-time officers remunerated on a scale proportional to the number of insured patients they have lost by the abolition of panels. All new entrants would be on a whole-time salaried basis, so that as the older members retired the service would become completely whole-time. Free choice of doctor being in this way gradually and almost imperceptibly abolished, no substitute is suggested for that form of healthy competition which induces the newly qualified as well as the more experienced men to do his utmost for his patients, not solely because he is keen on his work but because zeal does promote financial success.

A complete scheme for a general practitioner service was published [2] last week by the Medical Practitioners' Union. The Union has accepted as a working rule the need for expanding and modifying existing institutions, rather than abolishing them in favour of some new and untried system. The scheme is arranged in numbered paragraphs of which the gist is as follows:—

(1) Whilst not condemning contributory schemes as such the Union is unable to discover any place which they might usefully and economically occupy in an extended general practitioner service.

(2) Medical benefit should be extended to the whole population.

(3) So much of the present contribution as is applied to the provision of medical benefit (doctoring as apart from sick pay) should cease.

(4) Medical benefit should be removed from the control of approved societies.

(5) There should be unrestricted right of choice and change of doctor, subject to certain disciplinary arrangements suggested for the investigation of abuse.

(6) General practitioner consultations should be part of ordinary medical benefit.

To administer these proposals the Union suggests that the local offices of the medical service should be independent entities. The insurance committee would become the county medical service committee; the panel committee would become the county medical committee. The present central negotiating body (I.A.C.) would become the central medical committee, composed of nominees of the county medical committees. The disciplinary machinery would be this:—

(*a*) The clerk of the medical service committee would investigate and deal with early complaints of trivial nature.

(*b*) Complaints of more serious nature, being generally due to a financial factor, would be less frequent when capable of settlement locally; the complaint would go through a purely professional tribunal to the judicial subcommittee of the county medical committee.

(*c*) Cases for removal from the service would be referred to a reformed General Medical Council.

In this scheme some 40 million persons would be provided with the services of 20,000 practitioners and the Union suggests a capitation fee of 13*s*. per head, of which 1*s*. is for mileage, this being for general practitioner service alone. Finally the Union recommends the encouragement of existing maternity services by the State as it sees fit, but is "strongly opposed to the grandiose schemes which are often demanded but whose authors betray little knowledge of the real issues at stake"—e.g., the necessity of dealing with the factor of maternal resistance to microbes and not concentrating solely upon asepsis. Grants might be made by the State for individual specialist treatment at institutions, bearing in mind that as soon as the State assumes responsibility for providing specialist services voluntary help of these institutions will probably seek some other channel for its outlet.

All these schemes are ostensibly drawn up to provide the best doctoring possible for the population upon terms which will attract the profession and yet will not be burdensome upon those who have to bear the cost. Hitherto, the method of attendance in ordinary private practice has been the ideal to be aimed at, the patient choosing his doctor and paying him for his services, either party being at liberty to make a change whenever he wishes. Owing to its cost the bulk of the industrial population cannot afford to use this method; hence the need for some

[1] See THE LANCET, Oct. 6th, 1934, p. 768.
[2] Medical World, Oct. 12th, 1934, p. 205.

form of contract practice. Two deductions follow: Those who can afford private treatment should be able to have it without also paying for a form of contract treatment they do not require. Having on financial grounds made a contract the patient should then be assured of a service as similar as possible to that of private practice. The scheme of the M.P.U. does provide free choice and change of doctor, but in it the patient makes no contribution whatever towards its cost except through the rates. Presumably the public will not appreciate a service provided thus, any more than it does at the present time the services of the district medical officer. The suggested central negotiating body would not be as strong as that as at present constituted. Anyone who knows about the present Insurance Acts Committee appreciates the representation on it of other activities not included in the general practitioner contract — hospitals, ophthalmic work, medical officer of health—whose opinion and advice are of the utmost value to insurance practitioners who form the bulk of the committee.

Unfortunately, most of the trouble about extending benefit to dependants is due to cost, although no doubt there are also administrative difficulties to overcome. Of the schemes mentioned one might cost less, but by abolishing the pattern of practice—that adopted by all educated people who can afford it—would fail to attract men of ability into the profession. The other would increase the rates to such an extent as not to be popular with anyone, without compensating advantage on the administrative side.

The Canadian Scheme

Economic depression in Canada has swollen the sections of the community who are unable to pay for the medical care they receive, or need but do not receive, and particularly the indigent section, for whom little provision has hitherto been made by the central or local government authorities. The responsibility for the care of the indigent rests upon the provinces, who may delegate it to the municipalities, but in general neither the provincial nor the municipal authorities have fulfilled this responsibility; and it seems that the federal government do not regard medical care as a necessity, since no provision has been made for it in the unemployment relief legislation. The result is that most indigent persons receive medical treatment as a private contribution to charity by the medical profession; and so firmly is the idea fixed in the public mind that this state of things is as it should be that surprise has been expressed that doctors should expect to be paid for the medical care of the indigent. It is not unnatural that Canadian doctors should seek some method whereby they would receive reasonable remuneration for the important services they render to the community.

Fortunately, the Canadian Medical Association have not failed to furnish leadership in these difficult times. For some years their committee on economics has studied the provision of medical care for persons unable from their own resources to pay for the medical services they need and has now issued [1] "A Plan for Health Insurance in Canada." This report—clear, concise, informative, and impartial—is an important contribution to what in America is called "medical economics." The first part describes what has been done in other countries to provide medical services on an insurance basis. The main features of the English scheme are well described and with due appreciation of the significance of the principles on which it is based. The local medical committees and the regional medical staff are regarded as two great assets of a scheme which is handicapped by the large number of approved societies doing work that could be better done by a single organisation administered by the State.

The report then formulates a plan of State health insurance suited to Canada's needs, providing a wide range of medical and ancillary services but no cash benefits. It would be administered centrally by the public health departments of the provincial governments, locally by the municipalities and rural local government authorities. The administrative authorities would be advised by central and local insurance boards representing the various interests concerned. It is regarded as of fundamental importance that the professional side of the medical service should be controlled by the organised medical profession; and in each province there would be a central medical services committee and local medical services committees, appointed by the provincial and local medical associations respectively, who would assume responsibility for the quality of the medical service and for the discipline of the doctors. Insurance under the scheme would be compulsory for all persons with dependents and an income of less than $2500, or without dependents and less than $1200. The cost of the scheme would be met by contributions from the insured persons, their employers, and the State. The contributions of indigent persons would be paid by the State; otherwise the conditions are the same for them. Insured persons and their dependents are to be provided with medical, dental, pharmaceutical, and nursing services, and hospital care; the doctors would include general practitioners and specialists, the relation between the former and the latter to be settled by the central medical services committee. Any doctor would have the right to enter the service, the insured person to have free choice of general practitioner; the method of medical remuneration in any area would be selected by the doctors of the area. The patients would pay part of the cost of the medicines prescribed for them, but would not, as in the French scheme, pay any part of the doctor's fee. Voluntary insurance, for hospital care only, would be open to persons with incomes above the insurance level.

The scheme, as has been said, includes no cash benefits. Its authors feel strongly that support during periods of incapacitating sickness should be a charge on unemployment insurance—the unemployment being due not to inability to obtain work, but to inability to perform it—and that cash benefits should be dissociated from health insurance. The tendency to separate cash benefits from insurance medical services has been steadily growing since it first found expression in the British scheme 23 years ago, when the Insurance Bill as originally introduced was modified by transferring the administration of medical benefit from the approved societies to insurance committees specially constituted for the purpose. But no national health insurance scheme without cash benefits has yet been established, and if the Canadian scheme reaches the legislative stage it may be found politically impossible to keep it free from some form of cash benefit. At present, however, the scheme has not gone beyond the stage of reference to the provincial medical associations, whose views are requested before Jan. 1st, 1935, when the executive committee of the C.M.A. will proceed to redraft the report in the light of those views for submission to the council of the Association.

[1] Canad. Med. Assoc. Jour., September, 1934, Supplement, p. 25.

PUBLIC HEALTH

A Memo on Maternal Mortality

IN Circular 1433 (1*d*.) the Ministry of Health is asking those parts of the country in which the death-rate of childbearing is high to get their medical officer of health to report on the circumstances and especially to what extent the recommendations of the final report (1932) of the Maternal Mortality Committee have been put in practice. When the medical officer has reported the Ministry offers to send one of its own medical staff to talk things over with the local authority. It was not expected that any measures adopted would immediately be reflected in the death-rate, but the Ministry has an impression that there are many areas in the country where the maternity service is neither complete nor satisfactory and that there may be room in all areas for more intensive efforts to educate women to use what facilities are provided. The circular is quite definite on the undesirability of providing small maternity homes as separate units and endorses the view of the departmental report that new maternity accommodation should wherever practicable be associated with general hospitals. In the last three years the number of maternity beds provided by local authorities has increased from 7070 to 7245; at the same time there has been a welcome tendency to concentrate maternity work at the transferred (municipal) hospitals. Although antenatal clinics are admittedly not all that they should be, it is gratifying that their number has increased from 1048 to 1340 during the past three years and particularly heartening to learn that the proportion of expectant mothers who avail themselves of the antenatal service has risen in the same time from 27 to 42 per cent.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED OCTOBER 6TH, 1934

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 3185; diphtheria, 1467; enteric fever, 34; acute pneumonia (primary or influenzal), 520; puerperal fever, 51; puerperal pyrexia, 109; cerebro-spinal fever, 17; acute poliomyelitis, 37; acute polio-encephalitis, 2; encephalitis lethargica, 6; dysentery, 18; ophthalmia neonatorum, 80. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Oct. 15th–16th was as follows: Small-pox, 1 under observation; scarlet fever, 1694; diphtheria, 1634; measles, 205; whooping-cough, 208; puerperal fever, 23 mothers (plus 12 babies); encephalitis lethargica, 268; poliomyelitis, 8; "other diseases," 300. At St. Margaret's Hospital there were 17 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 1 (1) from measles, 5 (1) from scarlet fever, 5 (1) from whooping-cough, 33 (10) from diphtheria, 49 (16) from diarrhœa and enteritis under two years, and 21 (4) from influenza. The figures in parentheses are those for London itself.

The only death from enteric fever was at Rochdale. No great town reported more than 2 deaths from diphtheria; Birkenhead, Leeds, Manchester, and Sheffield each reported 2. Liverpool reported 8 deaths from diarrhœa; Leeds, Derby, and Stoke-on-Trent each 3.

The number of stillbirths notified during the week was 269 (corresponding to a rate of 44 per 1000 total births), including 46 in London.

MEDICAL NEWS

Royal College of Surgeons of England

A quarterly meeting of the College was held on Oct. 11th, with Sir Holburt Waring, the president, in the chair. Mr. L. R. Broster was admitted a member of the court of examiners. Mr. J. F. Smith (Bristol Grammer School) was admitted the fifth Macloghlin scholar and Mr. W. R. L. Harrison (Epsom College) was nominated as the forty-second Jenks scholar. It was reported that the Sir Gilbert Blane gold medal for 1934 had been awarded to Surgeon Lieut.-Commander T. C. H. Neil. Mr. F. H. Bentley was reappointed Bernhard Baron scholar for a further period of six months.

Diplomas of membership were granted to Norman Angel, R. C. F. Catterall, G. B. Davis, and to Ratnayaka. A diploma of fellow was granted to J. B. Pennybacker (Edinburgh).

The following appointments were made for the primary fellowship examination to be held at Madras, beginning on Dec. 27th, 1934: Lieut.-Colonel K. G. Pandalai, assessor in anatomy; Major S. L. Bhatia, assessor in physiology; and Prof. P. K. Koshy Avargal, superintendent of dissections.

The council adopted its annual report to the Fellows and Members, and this will soon be circulated to those who have expressed a wish to receive it.

University of Cambridge

At recent examinations the following were successful:

D.M.R.E.

J. D. P. B. Boyd, A. A. Dunlevy, Morton Kahn, and W. D. C. McCrorie.

Among those who will receive honorary degrees at the opening of the new University library by the King on Oct. 22nd will be Dr. K. L. Landsteiner, of the Rockefeller Institute for Medical Research, New York, and Dr. L. J. Henderson, professor of biological chemistry at Harvard University.

University of London

The Surrey county council have made a grant of £50,000, payable over ten years, towards the erection of buildings on the new site of the University in Bloomsbury. The Hertfordshire county council have made a similar grant of £10,000.

University of Dublin

At recent examinations at the school of physic, Trinity College, the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.CH.

Part I.—(*Therapeutics, Pathology, &c.*).—M. R. W. Spacek (passed on high marks), S. E. M'Connell, R. F. Cantan, H. F. Sloan, S. H. Morrison, D. P. Beckett, Margaret Perry, Hyman Elliman, P. L. van Aardt, D. H. A. Irwin, John M'Quillan, J. R. Shapiro, R. S. MacL. Cooke, H. W. W. Good, N. J. Smith, Cecil Eppel, A. E. B. de Courcy Wheeler, Neville Jackson, and Eithne M. O'Connell.

University of Bristol

Prof. R. S. S. Statham has resigned from the chair of obstetrics in the University.

University of Sheffield

Mr. Ernest Finch, surgeon to the Sheffield Royal Infirmary, has been appointed to the chair of surgery in the university in succession to Prof. Graham Simpson, who has resigned

Mr. Finch won the entrance medical scholarship at Sheffield University in 1901, and after completing his medical training graduated as M.B. Lond. in 1906 and M.B. Sheff. (ad eund.) in 1908, proceeding to the M.D. Lond. in 1909 and the M.S. in 1913. In 1911 he became a fellow of the Royal College of Surgeons of England, and in the following year was elected assistant surgeon to the Royal Infirmary, and demonstrator of applied anatomy in the University. During the war he held the rank of major in the Royal Army Medical Corps (T.). As tutor in clinical surgery at the Royal Infirmary, and latterly as university lecturer in surgery, he has had a long experience of teaching. His contributions to medical and physiological journals include papers on the distribution of potassium salts in nerve-fibres, on derangements of the knee-joint, and on osteoclastoma.

University of Manchester

Dr. R. W. Fairbrother has been appointed lecturer in bacteriology and Dr. J. C. Kerrin succeeds him as assistant director of the routine section of the department of bacteriology and preventive medicine. Dr. D. T. Robinson has been appointed assistant lecturer in bacteriology, and Dr. I. A. Cathie and Dr. James Dawson demonstrators in pathology.

Samaritan Free Hospital for Women

Lord Moynihan will open the extension of this hospital on Tuesday, Nov. 13th, at 3 P.M.

Royal Free Hospital Post-graduate Course

A week-end post-graduate course for former students of the London School of Medicine for Women will be held at the Royal Free Hospital from Dec. 7th to 9th. Applications to join the course should reach the warden and secretary of the medical school not later than Nov. 30th.

Child-study Society, London.

On Nov. 8th Dr. Hazel Chodak Gregory, physician for children's diseases at the Royal Free Hospital, will speak at a meeting of this society on the importance of common colds. The meeting will be held at 6 P.M., at the Ben Uri Gallery, Woburn House, Upper Woburn-place, W.C., and Dr. Margaret Lowenfeld will be in the chair.

Grocers' Company Scholarships

The next election for the scholarships which the Grocers' Company offers with the object of encouraging original medical research will take place in May, 1935. Each scholarship is worth £300 per annum, and an allowance is given for apparatus and other expenses in connexion with the work. The scholarships are tenable for one year but are renewable for a second or third year. Applications must be sent before the end of April to the clerk, Grocers' Hall, London, E.C.2.

Royal Institution

Among the Friday evening discourses to be held before Christmas this year are lectures on elements and isotopes by Mr. F. W. Aston, D.Sc., F.R.S., on heavy water in chemistry by Dr. M. Polanyi, and on the crystallisation of alloys by Mr. C. H. Desch, D.Sc., F.R.S. The afternoon courses for which single lecture tickets are now available at 3*s.* each, include two lectures (Dec. 4th and 11th) on the Solid State, by Sir William Bragg, F.R.S. The Christmas course of six lectures for children will be delivered by Prof. W. L. Bragg, F.R.S., on Electricity.

Memorial to T. R. Armitage

The London County Council has decided to affix a tablet to the wall of 33, Cambridge-square, Paddington, to commemorate the residence of Dr. Thomas Rhodes Armitage. His sight having failed early in his medical career, he devoted himself and much of his private fortune to improving the condition of the blind in London, and was the chief introducer and promoter in this country of Braille writing and printing.

Fellowship of Medicine and Post-Graduate Medical Association

On Tuesday, Oct. 23rd, at the Medical Society of London, Chandos-street, Cavendish-square, W., at 2.30 P.M. Dr. A. E. Clarke-Kennedy is to lecture on Convulsions, and on Oct. 30th, Headache. The first lecture in the series on diet and dietetics will be given on Wednesday, Oct. 24th, at 8.30 P.M., at the Medical Society of London, by Prof. R. J. S. McDowall, who will deal with the general principles of dietetics. A week-end course in diseases of the chest will be held at the Hospital for Consumption, Brompton, on Oct. 27th and 28th, and other forthcoming courses include neurology at the West End Hospital for Nervous Diseases (Oct. 29th to Nov. 3rd); obstetrics at the City of London Maternity Hospital (Nov. 3rd and 4th); medicine, surgery, and gynæcology at the Royal Waterloo Hospital (Nov. 5th to 24th); diseases of the chest at the Victoria Park Hospital (Nov. 5th to 10th); urology at St. Peter's Hospital (Nov. 5th to 17th). The panel of teachers provides individual clinics in various branches of medicine and surgery daily. The courses of instruction and the clinics arranged by the Fellowship are open only to members. Further particulars may be had from the secretary of the Fellowship, 1, Wimpole-street, London, W.1.

On Friday, Oct. 26th, at 8.45 P.M., at the Princess Elizabeth of York Hospital for Children, Glamis-road, Shadwell, E., the Rt. Rev. Bishop H. L. Paget, hon. chaplain to St. Bartholomew's Hospital, will give a talk entitled Sir James Paget at Home. Prof. G. Grey Turner will preside, and visitors are invited.

Noise in London

Lady Horder will take the chair at a meeting of the London Society which is being held at the hall of the Royal Society of Arts, 18, John-street, W.C., at 5 P.M., on Friday, Oct. 19th. Wing-Commander Cave-Brown-Cave, professor of engineering at University College, Southampton, is to read a paper entitled No Needless Noise.

Memorial to Dr. Stenhouse Williams

On Oct. 13th Sir Hilton Young, Minister of Health, opened the Stenhouse Williams memorial library at the National Institute for Research in Dairying, near Reading. Prof. Stenhouse Williams was director of the institute from its establishment in 1912 until his death two years ago.

Post-graduate Lectures on Sundays

The staff of Charing Cross Hospital are again holding a Sunday course for post-graduates this autumn. Each Sunday there are two lectures, at 10.30 and 11.45 A.M., given in the medical school, and the series begins on Oct. 21st with those of Dr. E. C. Warner (investigation and treatment of chronic arthritis) and Dr. H. G. Everard Williams (some aspects of medical gynæcology). A fee is charged to cover printing and incidental expenses. Further particulars may be had from the secretary of the medical school, 62, Chandos-street, London, W.C.2.

Royce Research Fellowships

In accordance with the wish of Sir Henry Royce that one-tenth of his fortune should be used to promote research for the "distribution of knowledge for the purpose of improving the health of and preventing disease to the human race," the trustees of his will after consultation with the University of Manchester have decided to endow two fellowships, one at Manchester and one at London, for research into effective methods of dealing with influenza and the common cold. The fellowships will be known as the Royce Research Fellowships, and will be worth £500 a year. They are to be tenable for three years, and may be extended at the discretion of the trustees for two further periods of two years.

Chadwick Lectures

The autumn programme of the Chadwick Trust opens with a lecture on sanitation in rural areas in the tropics and sub-tropics by Dr. D. B. Blacklock, professor of parasitology at the Liverpool School of Tropical Medicine. The lecture will take place at the house of the Royal Society of Tropical Medicine and Hygiene, 26, Portland-place, London, W., at 5.30 P.M., on Thursday, Oct. 25th. Mrs. Margaret Fishenden, D.Sc., will give the second lecture and on Nov. 7th at 8.15 P.M. will speak on Health and the Indoors Climate. The meeting place will be the same. On Nov. 9th at 7.30 P.M., at Huddersfield, Dr. Matthew B. Ray will speak on Fifty Years of Public Health Progress. On Nov. 23rd Sir Raymond Unwin will discuss Good Housing as the Basis of Individual and Social Health, and on Dec. 10th Dr. F. R. Seymour, medical officer at the Ministry of Health, will speak on Men and Masses. Further particulars may be had from the secretary of the trust, 204, Abbey House, S.W.

Glasgow Post-Graduate Medical Association

A series of lectures will be given at 3.30 P.M. on Tuesdays from Nov. 27th in the hall of the Royal Faculty of Physicians and Surgeons, dealing with some of the practical problems of medicine in the light of recent research At 4.15 P.M. on Wednesdays from Nov. 7th there will be clinical demonstrations. A special course in ophthalmology will be held at the Glasgow Eye Infirmary and at the Ophthalmic Institution; there will be demonstrations at the Ear Nose, and Throat Hospitals; and the Radium Institute will give a course on radium therapy. Facilities for the study of clinical obstetrics and antenatal work are offered at the Royal Maternity and Women's Hospital. The secretary of the association is Dr. James Carslaw, 9, Woodside-terrace, Glasgow, C.3.

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors held on Oct. 10th, special grants, amounting to £87 10*s*., were voted to orphans to enable them to continue their education. It was decided to make a Christmas present of £15 to each widow over 75 years of age, £10 to each widow under 75, and £10 to each orphan. The widows of two recently deceased members will shortly be coming on the funds, with a yearly grant of £60. A widow, whose death was reported, came on the funds in 1919 and died in June, 1934. During this time she received in grants a total of £1170. Her husband, before he died, had paid in subscriptions £31 10*s*. Membership of the Society is open to any medical man who, at the time of his election, is residing within a 20-mile radius of Charing Cross. Information on application to the secretary at 11, Chandos-street, W.1.

Sussex Medical and Dental Golfing Society

The autumn meeting was held at the Dyke Golf Club, Brighton, on Sept. 30th. The results were as follows: Captain's prize (presented by Dr. A. E. Drynan), Dr. H. Butcher 2 up; M. W. Pilcher, 1 up. Sealed holes prize: Dr. J. M. Anderson. Four-ball foursomes: Drs. Bond and Devlin, 4 up. Drs. J. Thwaites and J. K. Raymond and Drs. G. Thwaites and A. E. Drynan, both 2 up.

Ladies' Medical Golfing Society

The autumn meeting was held at Oxhey on Oct. 12th. The results were as follows: Cecil Leitch Challenge Cup: Mrs. McCullagh, 104—31=73. 1st Division. Scratch prize: Miss Uhthoff, 86. Handicap prizes: Mrs. Parnell, 89—11=78; Mrs. G. K. Cooper, 90—10=80; Mrs. Cavendish-Fuller, 87—5=82. 2nd Division. Scratch prize: Miss Phillips, 100. Handicap prizes: Mrs. McCullagh, 104—31=73; Mrs. Lindsay Rea, 112—29=83; Mrs. Maxwell-Chance, 116—31=85. Best Ball: Miss Uhthoff and Mrs. Russell-Smith, 79½. 12-hole Bogey Greensomes: Miss Uhthoff and Mrs. Russell-Smith tied with Mrs. Knowles and Mrs. Dickson at 1 up, and won on last 6 holes. Captain's prize for best net return for spring and autumn meetings: 1st Division. Mrs. Lewis-Smith; 2nd Division. Mrs. McCullagh.

The sum of £4 12*s*. 6*d*. was collected for the National Playing Fields Association.

Chelsea Clinical Society

The annual dinner of this society, held at the Rembrandt under the presidency of Dr. Charles Sundell, on Tuesday evening, was attended by consultant and practitioner members in about equal proportion. It is their kindly practice not to speak, whether in serious debate or on social occasion, until after good food—even very good food—and this is believed to have as beneficial an effect on their scientific discussion as on their hospitalities. Colonel T. M. Banks, D.S.O., in proposing the health of the Society and its President, excused himself from speaking to the toast by reason of knowing too little of the society and too much of its president, and went on to give some account of the medical care of a quarter of a million people in the Post Office where he has been controller in several departments. Under Dr. Bashford's initiative the medical examination of the staff before entry has provided an enormous body of "preliminary evidence." It has been ascertained, for instance, that boys are 16 lb. heavier and 1½ in. taller than before the war; girls 9 lb. heavier and 1 in. taller. An analysis of occupations and hobbies shows that among a sample of 100 girl telephonists 81 are regular country walkers, 15 of them covering 20 miles a day. Happily, he added, it is not necessary to dragoon the youth of this country into healthy exercises. Dr. Sundell in reply said the whole duty of a president was to sit tight, say little, and get people to do things for you; but to conduct a successful debate he must be an expert campanologist. The society was anything but highbrow; their first ordinary meeting was to deal with slimming, a later one with embalming. Dr. Henry MacCormac, proposing the Guests, refrained from taking the advice of a friend to "treat them rough," although he told a true story about a mislaid patient, which Lord Horder in reply capped with agreeable details. Lieut.-General J. A. Hartigan, also replying, recalled a predecessor of his who was a Chelsea man, Sir Hans Sloane, and spoke with feeling of the assistance rendered to Army medical services by civilian practitioners.

Royal College of Surgeons in Ireland

It is announced that Dr. Leonard Abrahamson has been elected to the chair of medicine at the college, rendered vacant by the retirement of Dr. V. W. Synge. Dr. Abrahamson, who is visiting physician to the Richmond, Whitworth, and Hardwicke hospitals, Dublin, is at present professor of pharmacology at the college.

Clapham Maternity Hospital: New Developments

This hospital, of which Dr. Annie McCall is director, was opened in 1889 for the accommodation of maternity patients of the poorer classes who desire to be attended by doctors of their own sex. It also affords to women medical students and candidates for the C.M.B. examinations the opportunity of training in obstetrics under women doctors. The hospital now has 50 beds. The annual report states that during 1933, 485 patients were admitted with 442 actual confinements in hospital and 58 confinements on the district. Only one mother died (in hospital, from pulmonary embolism 12 days after delivery), and it is noted that out of 3337 cases delivered since January, 1929, this is only the second maternal death. The maternal mortality over the whole life of the hospital is 1·66 per 1000. Dr. McCall draws attention to a hospital rule forbidding visitors which has kept some patients away but is regarded as definitely contributing to the welfare of the mothers. The infantile mortality is not clearly stated. It is announced that Dame Louise McIlroy, for 13 years director of the obstetrical unit of the Royal Free Hospital, has been appointed assistant director of the hospital, and has started a new antenatal clinic and a course of weekly lectures.

Welsh National School of Medicine

On Oct. 12th, with the Bishop of Monmouth, president of the school, in the chair, the new pharmacological laboratories in the Institute of Preventive Medicine at Cardiff were opened by Sir William Thomas, donor and founder of the building. Among the speakers was Dr. R. St. A. Heathcote, the head of the new department, who gave a brief but illuminating account of the history of pharmacology as a science. In the evening an address entitled Opportunity was delivered to the students by Prof. G. Grey Turner to mark the opening of the new session. In welcoming new students, he exhorted them to grasp the opportunity of acquiring the habit of work, a habit which, when once begun, was easy to continue. In retrospect the undergraduate days seemed to provide a wonderful opportunity for study, never likely to recur. The calling which they had wisely chosen was arduous and yielded no finality. Every success brought further demands, and success was the hardest of taskmasters. He adjured them in the words of Clifford Allbutt, "always to have work in hand, and always to have a plan." The writing down of their thoughts and observations was a practice they should cultivate in youth, for nothing made for accuracy and lucidity more than writing. The reading of medical journals, the discussion of cases with older and more experienced men, and the exposition of scientific subjects among their fellows were all practices which would imbue them with the spirit of their profession and lead them into ways which would profit them in later years. He warned them against attaching too much importance to relaxation; sport, and the mental relaxation it brought with it was good, but to foster a state of mind which looked upon sport as indispensable was wrong. Prof. Grey Turner went on to outline the great opportunities which the calling of medicine offered, and especially of the joy associated with alleviation of suffering. Prof. Grey Turner warned his audience against many of the pitfalls they would encounter in later life, notably of the temptation to self-advertisement, of setting themselves up beyond their financial station in their ambitions to succeed rapidly, of the perils of easy money, and of the acquiring of money by devious ways. He reminded them of the words of Francis Bacon, "A man ought warily to begin charges which once begun will continue, but in matters which return not he may be more magnificent."

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Oct. 22nd.

Odontology. 8 P.M. Mr. Frank Coleman: Presidential Address. Mr. H. Stobie: A Tumour of the Palate.

TUESDAY.

Medicine. 5 P.M. Discussion on The Ultimate Prognosis of Coronary Occlusion, to be opened by Prof. John Hay, followed by Dr. T. F. Cotton, and Dr. B. T. Parsons-Smith.

WEDNESDAY.

Comparative Medicine. 5 P.M. Prof. J. B. Buxton: Some Aspects of the Role of Tuberculin in the Control of Tuberculosis. (Presidential address.)

THURSDAY.

Urology. 8.30 P.M. Mr. J. B. Macalpine: The Musculature of the Bladder-neck in Health and Disease. (Presidential address.)

FRIDAY.

Disease in Children. 5 P.M. (Cases at 4.30 P.M.) Cases. Dr. W. S. C. Copeman: 1. Still's Disease Cured with Gold. Dr. Hazel Chodak Gregory and Dr. G. T. Calthrop: 2. Congenital Œsophageal Obstruction. Dr. J. Braithwaite: 3. Virilism, Giantism, and Pseudo-hermaphroditism in a Girl of Four Years. Dr. T. S. Rodgers (for Dr. A. Maitland-Jones): 4. Congenital Elevation of the Diaphragm. Dr. Watson (for Dr. A. King): 5. Hepatomegaly. Dr. B. Schlesinger: 6. Hydrocephalus with Precocious Puberty, following Post Basic Meningitis. Dr. E. Hinden (for Dr. Paterson): 7. Recovery after Pulmonary Abscess. (For Dr. Pearse Williams): 8. Congenital Abnormalities. Dr. D. Makepeace and Dr. Janet Roche (for Dr. H. Mackay): 9. Congenital Recto-urinary Fistula. Dr. A. M. Nussbrecker: 10. ? Idiopathic Hypertrophy of Heart. Dr. H. Mansell: 11. Graves's Disease in a Child of 8½. Dr. F. Parkes Weber: 12. Precocious Sexual and General (including Osseous) Development. Dr. P. R. Evans (for Dr. Thursfield): 13. Cœliac Disease with Venous Obstruction. Dr. R. W. B. Ellis (for Dr. Thursfield): 14. Diaphragmatic Hernia. 15. Neoplasm of Lung. Dr. R. H. Bailey (for Dr. Paterson): 16. Still's Disease. Other cases will be shown.

MEDICO-LEGAL SOCIETY.

THURSDAY, Oct. 25th.—8.30 P.M. (11, Chandos-street, W.), Mr. C. Ainsworth Mitchell: The Use of Invisible Rays in Criminology.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.

WEDNESDAY, Oct. 24th.—4.30 P.M., Clinical Cases.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, Oct. 22nd.—8.30 P.M., Dr. Leslie Witts: The Anæmias and their Treatment.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.

MONDAY, Oct. 22nd.—5 P.M., Mr. C. E. Shattock: Specimens illustrating Bone Tumours.

FRIDAY.—5 P.M., Dr. John Beattie: Functional Anatomy of the Pituitary Gland.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 22nd to SATURDAY, Oct. 27th.—MEDICAL SOCIETY OF LONDON, Chandos-street, Cavendish-square, W. Tues., 2.30 P.M., Dr. A. E. Clark-Kennedy: Convulsions.—Wed., 8.30 P.M., Prof. R. J. S. McDowall: General Principles of Dietetics.—ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W. Lecture-demonstrations in Physical Medicine, at 8 P.M.—ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C. Course in Dermatology. Lectures at 5 P.M.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Course in Gynæcology.—HOSPITAL FOR CONSUMPTION, Brompton, S.W. Course in Diseases of the Chest. Oct. 27th and 28th.—(Courses of instruction are open only to members and associates of the Fellowship.)

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.

THURSDAY, Oct. 25th.—3 P.M., Dr. Douglas McAlpine: Demonstration.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Oct. 22nd.—10 A.M., medical wards, skin clinic. 11 A.M., Surgical wards. 2 P.M., surgical and gynæcological wards, eye and gynæcological clinics. 4.15 P.M., Mr. Green-Armytage: Some Anxieties of Labour.

TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., throat clinic.

WEDNESDAY.—10 A.M., children's medical wards and clinic. 2 P.M., medical wards, eye clinic.

THURSDAY.—10 A.M., neurological and gynæcological clinics. 11.30 A.M., fracture demonstration. 2 P.M., eye and genito-urinary clinics. 4.15 P.M., Mr. Steadman: Periodontal Disease.

FRIDAY.—10 A.M., Skin Clinic. Noon, Lecture on Treatment. 2 P.M., Throat Clinic. 4.15 P.M., Dr. Owen: Jaundice and Hæmorrhage in the New Born.

SATURDAY.—10 A.M., medical and surgical wards, children's and surgical clinics.

Daily at 2 P.M., operations, medical and surgical clinics. (The lectures at 4.15 P.M. are open to all medical practitioners without fee.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

MONDAY, Oct. 22nd.—10 A.M., Dr. E. A. Cockayne: Ward Visit. 11 A.M., Mr. E. I. Lloyd: Torticollis. Noon, Dr. W. Sheldon: Asthma. 2 P.M., Dr. H. Thursfield: Ward Visit. 3 P.M., Dr. D. N. Nabarro: Meningitis.

TUESDAY.—10 A.M., Dr. W. Pearson: Ward Visit. 11 A.M., Mr. T. T. Higgins: Inflammation of the Hip-joint. Noon, Dr. B. E. Schlesinger: Enlargement of the Liver and Spleen. 2 P.M., Dr. R. S. Frew: Ward Visit. 3 P.M., Dr. J. C. Hawksley: The Diagnostic Value of Blood Films.

WEDNESDAY.—10 A.M., Dr. D. Paterson: I. Infant Feeding. 11 A.M., Dr. R. T. Brain: Diseases of the Skin. Noon, Mr. D. Browne: The Treatment of Empyema. 2 P.M., Mr. J. Crooks: The Treatment of Sinus Infection and Otitis Media. 3 P.M., Dr. W. W. Payne: Bio-chemical Tests in General Practice.

THURSDAY.—10 A.M., Mr. Lloyd: Some Orthopædic Cases. 11 A.M., Dr. W. G. Wyllie: Treatment of Osteomyelitis. Noon, Mr. H. Tyrrell-Gray: Obesity in Children. 2 P.M., Dr. Thursfield: Cœliac Disease. 3 P.M., Dr. A. G. Signy: Prophylaxis in Measles and Whooping-cough.

FRIDAY.—10 A.M., Dr. Pearson: Ward Visit. 11 A.M., Dr. A. A. Moncrieff: Pulmonary Affections. Noon, Mr. L. E. Barrington-Ward: Causes of Abdominal Pain. 2 P.M., Dr. Frew: Ward Visit. 3 P.M., Dr. R. W. B. Ellis: Glucose and Saline Therapy in the Treatment of Chronic Diarrhœa.

SATURDAY.—10 A.M., Dr. Paterson: II. The Premature Infant. 11 A.M., Mr. G. G. Penman: Squint and its Correction. Noon, Mr. A. Simpson-Smith: Selected Cases.

CHARING CROSS HOSPITAL, W.C.

SUNDAY, Oct. 21st.—10.30 A.M., Dr. E. C. Warner: Investigation and Treatment of Chronic Arthritis. 11.45 A.M., Dr. H. G. Everard Williams: Some Aspects of Medical Gynæcology.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, Oct. 24th.—4.30 P.M., Mr. Stanford Cade: Prognosis in Relation to Treatment of Cancer of the Bladder and Prostate.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Oct. 22nd.—3.30 P.M., Dr. Carmichael: Physiology of the Sympathetic System.

TUESDAY.—3.30 P.M., Dr. Denny-Brown: Brain-stem Reflexes.

WEDNESDAY.—3.30 P.M., Dr. Collier: Clinical Demonstration.

THURSDAY.—3.30 P.M., Dr. Denny-Brown: Conditional Reflexes.

FRIDAY.—3.30 P.M., Dr. Bernard Hart: The Psychoneuroses.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Oct. 22nd to SATURDAY: Intensive Course in Laryngology, Rhinology, and Otology. (Last week.)

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.

WEDNESDAY, Oct. 24th.—4 P.M., Mr. Geoffrey Keynes: Diagnosis and Treatment of Early Carcinoma of the Breast.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.

THURSDAY, Oct. 25th.—9 P.M., Mr. St. J. D. Buxton: Causation of Limp.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.

TUESDAY, Oct. 23rd.—5 P.M., Dr. H. D. Haldin-Davis: Acne and Rosacea.

THURSDAY.—5 P.M., Dr. A. M. H. Gray: The Sarcoids and Lupus Pernio. (Chesterfield lectures.)

CHADWICK PUBLIC LECTURE.

THURSDAY, Oct. 25th.—5.30 P.M. (Manson House, 26, Portland-place, W.), Prof. D. B. Blacklock: Sanitation in Rural Areas in the Tropics with special reference to Housing.

UNIVERSITY OF LONDON.

MONDAY, Oct. 22nd.—4.15 P.M. (University College Hospital Medical School), Prof. Charles Singer: Three Phases in the History of Scientific Medicine: (2) Galen.

INSTITUTE OF MEDICAL PSYCHOLOGY, Malet-place, W.C.

TUESDAY, Oct. 23rd.—6 P.M., Prof. C. G. Seligman: Psychology and Racial Differences.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, Oct. 24th.—3.30 P.M., Mr. Aleck Bourne: Antenatal Care as a Branch of Preventive Medicine.

ANCOATS HOSPITAL, Manchester.

THURSDAY, Oct. 25th.—4.15 P.M., Dr. W. J. S. Reid: The Borderline Patient.

LEEDS GENERAL INFIRMARY.

TUESDAY, Oct. 23rd.—3.30 P.M., Mr. Collinson: Demonstration of Surgical Cases.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, Oct. 23rd.—4.15 P.M., Mr. E. D. Telford: Mega-Colon.

FRIDAY.—4.15 P.M., Dr. Crighton Bramwell: Demonstration of Cardiac Cases.

NOTES, COMMENTS, AND ABSTRACTS

PATIENT AND DOCTOR*

BY Sir HENRY BRACKENBURY, M.D., LL.D.

MY audience is entirely composed of those who are either doctors or patients—at least, potential patients—or both, and the relation of these two classes of persons to one another would seem to offer some points of interest to all. The subject I have chosen has this further propriety, that most important aspects of it are not taught at all in the medical student's undergraduate course, and he has to acquire such knowledge as he can by way of post-graduate observation and experience. You will observe that, as every good doctor should, I put the patient first. A short time ago I received, in common I suppose with a great many of my professional colleagues, as part of an advertisement from a firm of wholesale druggists, a reproduction of an old cartoon which depicted the doctor in three aspects: (1) as an angel when called to the bedside of a sick man; (2) as a god when the cure had been effected; and (3) as the very devil when presenting his bill. Whatever other implications there may be in such a presentment, it at least indicated this, that the relation between patient and doctor is of considerable importance, and that the reactions involved may be of a somewhat violent character and demonstrate an emotional rather than a rational basis. It is the nature and the consequences of these relations and reactions that I propose to consider with you.

PERSONAL RELATIONSHIPS

It is fundamental to note that the relationship we are considering is between a person who is a patient and a person who is a doctor, not one between healer and disease. No doctor in practice can be, or should be, a detached scientific observer dealing quite objectively with some morbid process taking place within a relatively uninteresting vehicle which is the patient's body. The patient's general attitude should not be that indicated by the question, "What disease have I got, and will you cure it?" but that shown by such a question as, "Will you try to discover why I am ill and help me to restore my health and keep it?" The doctor should be regarded primarily and mainly as an expert helper and health adviser, rather than as a disease curer. The picture of the doctor at the bedside as a helpful and comforting angel may still, I hope, be largely true, but to depict him as an almighty being exorcising a disease by some mysterious or magic procedure, or effecting a cure of himself without reference to the patient or his attendants, is in almost every case an irrational and outrageous caricature.

Further, since this relationship is one of persons, it is essential to have regard not merely to the body but to the whole personality. It is never the body only which is out of health, but always the person. Each of us has a psyche; and however you may analyse or subdivide this, and by whatever name you call it—whether consciousness, mind, soul, spirit—it partakes of the physical disturbance, and inevitably and invariably constitutes part of the problem with which both patient and doctor have to do. Indeed, we have come to recognise that in a large proportion of cases of ill-health it is the psyche which is primarily affected and that physical changes may be only secondary or subordinate thereto.

Such then being the composite problem presented by every patient, and such being the main function to be exercised by the doctor, what are the principal qualities which a patient should, and usually does, look for in his doctor—having in mind primarily the general practitioner or family doctor?

Qualities in the Doctor

The basis of successful practical work in medicine can only be a thorough scientific training. All great doctors have not only been the products of such training, but have realised the need for pursuing their scientific studies ceaselessly. It is to me somewhat astonishing that in the midst of strenuous professional work to-day so large a proportion of what I may call average doctors do in fact find it possible, by one means or another, to keep pace with the continuance, and at times rapid, advance in the science and art of medicine and surgery. Doubtless part of the explanation is that if a man did not so keep pace he would be rapidly overhauled by a younger generation. It is axiomatic, then, that sound and extensive knowledge must be the foundation of a doctor's equipment. If I say that, in the case of a general practitioner, this knowledge should be full rather than deep (as I use the terms) I must not be understood to mean that his knowledge need not be more than shallow. There are degrees of depth and degrees of fullness, and all that I wish to suggest is that the knowledge a patient may properly look for in his family doctor, while in no sense inferior in kind to that required of a consultant or specialist, should be characterised by fullness over a wide field rather than by depth over a smaller area. This, of course, involves the ability to appreciate the occasions on which there is needed a knowledge still more profound in the smaller areas contained within the field.

The power of a doctor to apply his knowledge is, of course, of at least equal importance to its possession. This presupposes the qualities of skill and judgment. When I use the word skill in this connexion I am thinking mainly, though by no means entirely, of manual skill; and of such skill not with reference to major operations, which may properly be held to require special training and experience, but with regard to such things as sufficient expertness in the examination of the eye, ear, throat, and other parts of the body; such procedures as intravenous medication and lumbar puncture, and those many minor surgical operations which are common necessities and of which, therefore, every general practitioner has the opportunity of considerable experience. It seems to me wholly unreasonable, inconvenient, and disadvantageous that a patient should be compelled in such cases to consult or employ a number of different doctors, except in quite special circumstances. By judgment I mean the faculty of making with reasonable promptness a considered and wise decision.

In the practice of medicine some lack of knowledge or imperfection of skill, some erroneous inference or minor error of judgment, has occasionally to be recognised, understood, and forgiven; but what the patient has a right to expect from his doctor in every instance is carefulness in making a complete and thorough investigation into his condition. It is gross negligence in this direction which, I think, can alone justify the bringing of an action for malpractice against a doctor; and, short of such action, it is impossible to blame a patient who takes a serious view of such failure.

Knowledge, skill, carefulness can within reasonable limits be acquired by a student at his medical school; indeed, many as are the improvements required in medical education, it may be said that in respect to these three things there is, in the best British schools, no deficiency which might not easily be made good. Understanding and sympathy, however, and wisdom or judgment in the application of knowledge and skill, and in the direction and expression of sympathy, cannot be taught in the same way. These are qualities which depend largely upon innate characteristics or upon early environment and

* Substance of an inaugural address given at the opening of the session at the Hampstead General and North-West London Hospital on Oct. 17th, 1934.

upbringing. They can be encouraged and cultivated, but they can scarcely be created in a student by the medical staff of a school or hospital. Yet they are essential possessions for every good doctor, and fundamental requirements made of him by almost every patient. It is by no means invariably the case that the most learned physician or the most highly skilled surgeon proves to be the best medical adviser.

REACTIONS OF THE PATIENT

What is it, in this regard, that the doctor is required to realise and understand? To answer this question in full would be to describe something of the personality of every patient and to follow the whole content and activity of his mind. Every patient in some degree is undergoing a mental strain; often quite severe and altogether out of proportion to his physical illness or injury. This is something of which it is important, even urgent, that he should be relieved; and if a doctor sets out to influence a patient's mind rightly he must certainly try to learn as far as he can what is going on in that mind. Medical schools ought to pay much more attention to this matter, though it is true that the capacity to enter into the inner feelings of patients can only progress by an increasing experience both of individual patients and of the vicissitudes of human life. There are just a few major points which may be indicated as requiring in particular the doctor's understanding and sympathy. These are the patient's ignorance, his anxieties, his fears, his pain, and discomfort.

It is not easy for the doctor to realise the colossal ignorance of the laity of things which are to him ingrained or even axiomatic. I have sometimes thought that the lay mind, even if what is commonly regarded as well-educated, is unable to form any sort of clear image of anatomical or pathological conditions; and this in spite of an extended attempt at popular health education and of a common use of medical terms and glib talk about illness, which seems to indicate that the layman is hardly aware of his own ignorance. This is an important matter; for it is not only a serious obstacle to a doctor giving a rational explanation to a patient of his condition (so often and so naturally demanded); but is the major cause of all the superstition, quackery, and nonsense in medical questions still so astonishingly prevalent among persons who, in other spheres of which they have more knowledge, are able to think logically and well. The causes of illness seem easier for a layman to understand than are anatomical conditions and changes; and yet it has been said that even to-day patients know of only five actual causes of disease—chill, errors of diet, accident, fright, and medical treatment—this last being evidenced by the common attribution of most changes for the worse in an illness and almost every complication to the doctor's imperfect conduct of the case. Of course there are exceptions; but it is necessary to recognise that the patient's ignorance, even beyond what may reasonably be expected, has to be taken into consideration by the doctor in his efforts to appreciate and relieve his patient's state of mind.

The patient's anxieties and fears are at least equally real and important. Agitation may seize a patient even in the very act of making up his mind to consult a doctor at all; and anxiety as to the effect of being ill upon his job, or his business, or domestic duty, or finance, may loom very large. The fear of death does not, in my experience, usually become a great factor in the situation, unless it be occasionally as an aggravation of the anxieties just mentioned. At the time that I first entered upon private practice, some 40 years ago, I fancy that the dread of tuberculosis, or consumption of the lungs, was the chief fear which occupied many a patient's mind. To-day this has almost disappeared, and the underlying fear is of appendicitis, or much more pervasively, of cancer. The doctor learns before long that this last fear is in the mind of almost every woman of middle age who comes to consult him, and of a considerable proportion of men as well. Happily in the great majority of cases, even without the fear being expressed, the doctor is able to give a confident reassurance, and he can almost always truthfully encourage even when he cannot dogmatically deny. The relief given immediately in this way by a wise doctor may be immense. Similarly the fear of operation, or sometimes of the anæsthetic when operation is mentioned, may amount to terror, and greatly influence the patient's attitude and progress.

When we pass to the patient's acute discomfort and pain, other considerations apply. We must recognise, even the patient must recognise, that pain may have its importance as Nature's means of pointing out the position and character of some bodily lesion, and that as such it may be a valuable indication which the doctor has to observe and weigh and fit into the picture which he is drawing for himself of the patient's whole condition. This pain may in itself, quite apart from its underlying cause, be so filling and even warping the patient's mind as to need the most prompt relief; not only should this relief be given as soon as may be, but the constant preoccupation of the doctor on behalf of his patient should be to anticipate, to prevent, and to avoid pain and discomfort wherever possible. It is no part of my present business to suggest the innumerable ways in which this can be done; but herein lies the reason that a patient's thankfulness often goes out to his nurse even more than to his doctor, and why, I think, it might not be amiss if every doctor in the earlier part of his career had to experience in his own person one serious illness. It is of little use to tell a patient that he will be better to-morrow when it is a terror to him to live through the next five minutes. Every patient has a right to ask for the minimum of discomfort. I sometimes wonder whether in our hospital arrangements in this country we take sufficient notice of these mental stresses arising from ignorance, anxiety, various fears, discomfort, and pain. Are our arrangements all that they should be with regard to, say, the admission of a patient, the preparation for, or immediate recovery from, an operation, the administration of anæsthetics, the conduct of the solemn event of death, both in regard to the patient himself and to other patients in the same ward?

THE PUBLIC SIGNIFICANCE OF MEDICAL REGISTRATION

When I enumerated some of the qualities that a patient looked for in a doctor I followed "understanding and sympathy" with "moral character." I will not enlarge upon this, except to remind you of the old saying that "a good doctor must be a good man"; and of the fact that the General Medical Council was established by Act of Parliament entirely for the safety of the public, not for the protection of the medical profession, and that one of its duties is to keep the Medical Register pure, not merely by securing a minimum standard of medical education and qualification, but by removing from the Register the names of practitioners whose moral conduct in relation to the rendering of professional services has been proved to be a serious danger to the public.

The relation of a patient to a consultant or specialist is not quite the same. Though all the same qualities are essential in the doctor, their relative importance or the respective emphasis to be placed on them seems to me rather different. For example (I say it with some trepidation) sympathetic understanding does not need to be so pervasive; and knowledge and skill must be paramount, and (in the sense in which I have already explained the terms) deep rather than full. Within his chosen less extensive, but not necessarily narrow, sphere, the specialist's knowledge and skill should be expected to be as complete as is humanly possible. Though the connexions between his own field of practice and other fields must be thoroughly appreciated, it should be considered unwise for him to wander beyond his own domains. Moreover, the relation between the patient and the

consultant should, strictly speaking, be indirect. It should be established and continued through or in coöperation with the general practitioner.

Qualities in the Patient

In the mutual relationship of patient and doctor the qualities expected in a patient are much less numerous and exacting than those which may properly be required in the doctor. The essence of the matter is coöperation; and to assure this the doctor is entitled to ask for the patient's obedience and confidence. I do not mean, nor does a doctor expect, implicit and unquestioning obedience or uncritical confidence, but those qualities shown and exercised in accordance with a helpful common sense. Horace Walpole tells us: "I have had a severe attack of the gout, and could not sleep. I consulted my physician: he advised me not to use opium. As soon as he was gone I sent out for some. I took it (five grains if memory may be trusted), have slept well, and am almost recovered." I imagine that conduct of that foolhardy character, acting in a manner directly contrary to the advice given, is unlikely to-day in anyone who consults a doctor at all; but I suspect that a more passive form of disobedience has considerable prevalence still. If the patient has doubts or disinclinations it is far better to express them and seek explanation by relevant questions, and no other course is fair to the doctor.

Mutual confidence between patient and doctor is of the first importance for successful medical relationship and treatment. It is for this reason that the medical profession has insisted, and is insisting so far as it can, in all schemes for providing medical attention, on as wide a freedom of choice of doctor by patient and of patient by doctor as can be reasonably afforded. This is just as important in the case of the poor, as it is with the well-to-do. This confidence is a subtle thing, but it involves on the patient's side complete truthfulness as to the disclosure of all relevant facts, and on the doctor's side complete sincerity and as much truthfulness as is compatible with his other responsibilities. In the interests of his patient he cannot always be completely frank about his opinions and conclusions, and he must not disclose the doubts and hesitations which in many cases he is bound to feel. A conscientious doctor may often find this attitude difficult. He must cultivate a confidence in his own judgment; and he should be aware how closely a patient studies his doctor's frame of mind, and often watches anxiously for every change of expression, look, and voice. A doctor should not attempt to inspire a patient's confidence by becoming an actor; sincerity is all, and most patients are quite capable of noting when a doctor's self-confidence merges into self-conceit, or even develops into megalomania.

Of the doctor as the devil who presents his bill I will say nothing, beyond making a few statements that I believe you will accept—that his service can often be only very inappropriately measured in guineas and shillings; that he is worthy of his hire, but has no delight in asking for it; that it may be one of the joys of health insurance practice that he can give his full attention to his patients without worrying about the presentation of an account; that he is usually considerate and patient; and that he is often placed in a difficult position even when he tries to be kind. A short time ago a doctor rendered an account for attendance on two maiden ladies, giving them a large reduction on his usual charge; he received in reply a letter which ran: "We are not paupers and do not like being treated as such; we shall therefore seek the services of another doctor in future."

A BRISTOL MATERNITY CLINIC.—The Bristol public health committee have approved revised plans for the erection of a central clinic for maternity and child welfare and tuberculosis which is estimated to cost £40,000.

PHYSICAL SIGNS IN ART

IN his presidential lecture to the Birmingham and Midland Institute on Oct. 12th Lord Moynihan emphasised the importance of the artist having some medical knowledge. The connexion between art and medicine, he said, had existed from the very birth of time, for Apollo was the god of art and it was upon his favourite son, Æsculapius, that he conferred the art of healing. As one went round the art galleries of the world one would find how close that connexion was.

Gargoyles, for example, were not executed in mad caprice or designed in extreme fantasy, but the idea often came from something in nature. The gargoyle over the west door of the Church of Santa Maria Formosa in Venice had been described by Ruskin as "huge, inhuman and monstrous"; yet actually it portrayed a person suffering from hystero-epilepsy. This disease was better known to the people of the Middle Ages, and was often portrayed, with varying degrees of accuracy, by medieval artists. The body arched, head and shoulders thrust back, eyes staring upwards, mouth open with tongue protruding, and clenched fists were rarely achieved, though Andrea del Sarto had painted a woman suffering from the disease which was accurate except that her hands were outstretched. As a contrast there was Raphael's "Ascension," so beautiful as a picture, but with almost every error from a medical point of view. Instead of going to see someone suffering from hystero-epilepsy, he had painted from the idea in his own mind, and the boy in the picture was represented as a malingerer.

Referring to the portrayal of the human emotions, Lord Moynihan said that from an anatomical point of view there was no flaw in the well-known "Death of Laocoön" in the Vatican. An ancient statue, whose creator was unknown, called "The Dying Gaul," was also as accurate medically as it was beautiful as a work of art. There was a wound in the right side of the chest and the great danger in such a case was that air would be sucked in through the wound. As a result normal respiratory methods were inadequate and the sufferer did everything possible to bring into play the accessory muscles of respiration. The hands would be firmly planted as they were in the statue.

Discussing a bust made of Alexander the Great as he was dying, Lord Moynihan told how he had a picture of the bust at his consulting-rooms and from it three of his colleagues had been able to diagnose the cause of death as cerebro-spinal meningitis. The recently discovered portrait of Henry VIII., which had been attributed to the younger Holbein, showed the monarch with a square almost mask-like face; his hair was scanty with the eyebrows completely gone, while the hands were full, fat, and flabby. This was a remarkably accurate delineation of the condition due to deficiency of thyroid secretion, and this condition explained some of the acts that were remembered to Henry's disrepute. In fact, many of the so-called crimes of people in great positions could be attributed, if examined closely, to medical defects.

Epstein's "Genesis," Lord Moynihan thought, did not fulfil the implication of its title. On close examination he had come to the conclusion that the lady was not in the condition suggested but was suffering from a large abdominal tumour.

A NEW URINACIDOMETER

WE have received from Messrs. Allen and Hanburys, Ltd., a new urinacidometer, termed "Allenburys," and designed to supply the doctor with means for rapid estimation of pH of urine samples. The apparatus is based upon the use of coloured charts matched against samples of urine tinted with prescribed indicators. The colours have been examined in special flat test-tubes, specimens of which are provided in the set. The urinacidometer case, an extremely neatly constructed affair, contains the

indicator solutions, five coloured charts corresponding to these, and flat test-tubes and pipette.

A careful description of the procedure to be employed accompanies the apparatus. One of the flat test-tubes is half filled through the pipette and 8 drops of the appropriate indicator solution are added, when the tube is corked and inverted two or three times to ensure distribution of the colour. The tube is then filled to the shoulder with the urine whose acidity is to be determined, and the liquids are generally mixed until they assume a uniform colour. The tube is then placed in a slot in front of the chart corresponding to the indicator, and its position adjusted until the match has been obtained. Five indicator solutions are included in the case—namely:—

	pH range
(1) Compound indicator	4 –9
(2) Brom. cresol green	4 –5·5
(3) Brom. cresol purple	5·4–6·4
(4) Brom. thymol blue	6·2–7·2
(5) Cresol red	7·2–8·6

The estimations are made in connexion with ketogenic diets, and it is pointed out that where the range of the reaction of the sample is unknown, time will be saved by making an approximate determination by the use of a compound indicator which is included among the charts. This indicator has a wide range from pH 4 to pH 9, and a colour change for each unit of pH between those extremes. If the colour obtained with the indicator is at the extreme end of its range the sample should be tested with a second indicator.

The average normal pH value of human urine (24-hour specimens) is about 6, but the reaction varies considerably with the nature of the diet, from pH 4·8 to pH 7·4 being held as a normal range, different diets modifying the acidity. With the urinacidometer are included useful notes on the results recorded from the use of ketogenic diets in certain diseases, and these are supported by accurate references to sound medical literature. The apparatus will doubtless be of high practical value if it is used in accordance with the unusually clear directions, and if the general indication is observed that all used test-tubes and sampling pipettes should be kept clean, and rinsed with distilled water after they are washed at the tap.

NEW PREPARATIONS

"WELLCOME" BRAND INSULIN (CRYST).—Messrs. Burroughs Wellcome and Co. announce that this preparation, the first commercial insulin made from pure crystalline insulin, is now available in 5 c.cm. phials containing 20 units per c.cm. at 2*s.* 3*d.* each.

DALTOSE.—This preparation, samples of which we have received from Messrs. Cow and Gate, Guildford, is designed to provide a mixed carbohydrate complement for addition to hot water or milk in the diet of children. The approximate analysis is: moisture 5 per cent., maltose and dextrose 56 per cent., dextrins 37 per cent., calcium lactate 2 per cent., international vitamin D units 2000 per lb. One ounce of daltose is stated to give the equivalent of two teaspoonfuls of high quality cod-liver oil. The preparation is readily soluble, and directions are sent with it indicating the measures to be added to each feed of milk in proportion to the age of the infant. The fact that there is a difference in percentage of sugar in human milk and cow's milk—2·5 per cent.—suggests the ration.

Appointments

KING, E. F., M.B. Brist., F.R.C.S. Eng., D.O.M.S., has been appointed Honorary Assistant Surgeon to the Central London Ophthalmic Hospital.

MARTIN, T. D. MASSON, M.R.C.S. Eng., House Physician to the Hertford County Hospital.

Vacancies

For further information refer to the advertisement columns.

Bangor, Caernarvonshire and Anglesey Infirmary.—Sen. and Jun. H.S. £150 and £100 respectively.
Birmingham City Mental Hospital.—Jun. Asst. M.O. £350.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Blackburn, Queen's Park Institution and Infirmary.—Res. Jun. Asst. M.O. At rate of £150.
Burnley Municipal General Hospital.—Res. Surg. O. £800.
Cardiff Isolation Hospital.—Asst. Res. M.O. £250.
Chesterfield and North Derbyshire Royal Hosp.—Res. Surg. O. £300.
Eastbourne, Royal Eye Hospital, Pevensey-road.—H.S. £100.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Surgeon to Throat, Nose and Ear Dept.
Evelina Hospital for Sick Children, S.E.—Fourth Surgeon and Fourth Physician. Each 50 guineas.
Glasgow Eye Infirmary.—Res. H.S. £100.
Gordon Hospital, Vauxhall Bridge-road, S.W.—Res. H.S. At rate of £100.
Grocers Company, Grocers' Hall, E.C.—Med. Research Scholarships. £300.
Hertford County Hospital.—Hon. Asst. Physician.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Anæsthetist.
Liverpool, Royal Southern Hospital.—Hon. Asst. Phy. Hon. Dermatologist. Also Hon. Med. Psychologist.
Liverpool University.—Louis Cohen Chair of Dental Surgery, &c. £1200–£1400.
L.C.C. Asst. M.O.'s. Each £470. Jun. M.O.'s. Each £7 per week. Also Temp. Dist. M.O. £200, £125, and £300 respectively.
London Jewish Hospital, Stepney Green, E.—Res. M.O., and H.P. At rate of £150. Also H.S. and Cas. O. Each at rate of £100.
Maidstone Borough.—Asst. M.O. £500.
Manchester, Ancoats Hospital.—Cas. O. £250.
Manchester County Mental Hospital, Prestwich.—Deputy Med. Supt. £750.
Manchester Ear Hospital, Grosvenor-square, All Saints'.—H.S. At rate of £150.
Market Drayton, Cheshire Joint Sanatorium.—Third Asst. M.O. £250.
Ministry of Health, Whitehall, S.W.—Deputy Regional M.O. £800.
Newcastle-upon-Tyne, Barrasford Sanatorium.—Res. Med. Asst. £250.
Oldham Royal Infirmary.—Cas. O. and H.S. At rate of £175.
Penshurst, Kent, Cassel Hospital for Functional Nervous Disorders, Swaylands.—Jun. Res. M.O. £400.
Plymouth, Prince of Wales's Hospital.—Res. Surg. O. At rate of £170.
Preston, County Mental Hospital, Whittingham.—Res. Jun. Asst. M.O. £500.
Prestwich, Manchester, County Mental Hospital.—Jun. Asst. M.O. £500.
Royal Dental Hospital of London, Leicester-square, W.C.—Two part-time House Anæsthetists. 10*s.* 6*d.* per session.
Royal Free Hospital, &c., W.C.—Sen. Asst. £350. Second Asst. £500. Also Third Asst. £270.
Royal Northern Hospital, Holloway, N.—Second Ophth. Surgeon.
St. Marylebone General Dispensary, 30, Marylebone-lane, W.—Hon. M.O. in Woman Workers' Dept.
Stockport Infirmary.—H.P. £150.
Sutton and Cheam Hospital.—Hon. Anæsthetist.
Swansea County Borough.—Asst. M.O. £500. Also Res. M.O. for Infectious Diseases Hospital. £350.
Ventnor, Isle of Wight, Royal National Hospital for Consumption &c.—Jun. Asst. Res. M.O. At rate of £300.
Warwick, King Edward VII. Memorial Sanatorium, Hertford Hill.—Sen. Asst. M.O. At rate of £275.
West Bromwich County Borough, Hallam Hospital.—Two Res. H.P.'s. Also one Res. H.S. All at rate of £200.
The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Burgess Hill, Sussex.

Births, Marriages, and Deaths

BIRTHS

GLOVER.—On Oct. 12th, at Forton-road, Gosport, the wife of J. L. Glover, B.M. Oxon., of a son.
SCARFF.—On Oct. 7th, at Pembroke-road, Clifton, Bristol, the wife of Gordon R. Scarff, F.R.C.S. Edin., of a daughter.

MARRIAGES

ANNANDALE—PANTON.—On Oct. 1st, at Stonehaven, James Scott Annandale, M.B. Aberd., D.P.M., Newmachar, to Bessie, youngest daughter of the late Mr. and Mrs. Wm. Panton, Aberdeen.
EVANS—TAYLOUR.—On Oct. 4th, at Pennington, Hants, Dr. Thomas Evans, to Enid Allardice, youngest daughter of Mr. Herbert F. Taylour, of Pennington.
WINDLE—ABBOTT.—On Oct. 6th, at All Saints' Church, Hove, Reginald W. Windle, M.B. Camb., to Joyce, only daughter of Mr. and Mrs. Willoughby Abbott, of Hove, Sussex, and of Capetown.

DEATHS

CRAIG.—On Oct. 11th, at Gloucester-road, Regent's Park, James Crawford Craig, M.B. Edin., D.P.H.
KEITH.—On Oct. 13th, at Homefield, Downe, Kent, Celia, beloved wife of Sir Arthur Keith, aged 64 years.
POWELL-EVANS.—On Oct. 11th, at Compton-road, Wimbledon, David Robert Powell-Evans, M.R.C.S., L.S.A., in his 73rd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.